human-machine interactions, rules interpretations, and activation of highway-rail intersection (grade crossing) protection devices.

A key example of the type of physical/communications infrastructure development implied by high speed passenger service using freight rail lines is advance activation of grade crossing devices in high speed territory. When a train is operating at high speed (80 mph or greater), use of conventional track circuits to activate crossing devices becomes problematic. This is due to the long distance between the crossing and the train at the time the crossing device must activate – assuming the normal 20 to 30 second warning/gate-closing time provided for motor vehicle traffic. Using conventional technology, at least one, and perhaps two, additional track circuit pairs must be added for each highway/rail intersection to be encountered at high speed. A PTC development program on Amtrak-owned trackage in Michigan is testing the use of RF messages in lieu of conventional track circuits for advance activation. A similar strategy is proposed for development and testing in the NAJPTC Program in Illinois. It is expected that the RF approach will prove acceptable from safety and cost perspectives, provided secure, exclusive-use data communications channels are available. There appears to be little question that the crossing arming/activation function will place major demands on RF communications capacity in high speed passenger rail deployments of this kind.

F. Location determination is a nearly universal feature of PTC systems, and one that has been subject to substantial technology change in the last decade.

All current PTC development projects outside the Northeast Corridor are investigating use of the Global Positioning System (GPS) with Differential Corrections delivered over RF links. Most, if not all, of these systems also use some type of map-matching between mobile GPS readings and geographic data elements transferred from an off-board database to the locomotive or other mobile vehicle.

The new hybrid positioning systems are probably more cost-effective in wide-scale deployments than the transponder-based location determination systems contemplated prior to availability of the GPS/DGPS option in the last decade, and will have major implications for data communications reliability, coverage, and throughput capacity.

G. Future Direction of PTC Will Continue to be Evolutionary

From the perspective of utilizing the six channel pairs at 900 MHz to help realize public benefits of train control, it is clear that the evolution from ATCS in the late 1980s to PTC today has been, and will continue to be, a success story. Today's technological, institutional, and regulatory environment is much more conducive to successful PTC design and deployment. AAR respectfully submits that approval by the Commission of the proposal in this petition for the licensing and management of the "ATCS/PTC" channels is a necessary and useful step toward the goal of widespread PTC implementation.

III. DESCRIPTION OF PAST AND PRESENT EXPERIMENTS, TRIALS AND PILOT PROGRAMS

A. Summary of Past Programs.

At least 12 projects have been undertaken over the past 15 years to develop communications-based train control systems, now called Positive Train Control (PTC) systems.

The most comprehensive PTC project was a joint program sponsored by the Union Pacific ("UP") and Burlington Northern Santa Fe ("BNSF") railroads. This pilot project covered territory in the states of Washington and Oregon, representing all of the current types of train movement control from CTC to track warrants. The UP/BNSF system was designed as an overlay on the existing movement control systems, and was designed to be "interoperable" between UP and BNSF. Interoperability is an important feature for PTC and is defined as the ability of a "foreign" locomotive to operate on another railroad's system seamlessly. In other words, BNSF locomotives can communicate with the Union Pacific dispatch office when operating on UP track, and UP locomotives can communicate with the BNSF dispatch office when operating on BNSF track.

The concept of interoperability is very important to the railroads, particularly as a result of recent mergers which expanded the use of "trackage rights" arrangements permitting the operation of trains from a connecting railroad as "tenants" on the owning railroad, together with the host railroad's own trains. Perhaps the most recognizable example of "trackage rights" is Amtrak's operation of passenger trains over thousands of miles of track owned by freight

railroads. PTC must be designed to meet these interoperability requirements, which will provide for "tenant" locomotives to come on line at track speed (i.e., without a severe operating or scheduling penalty).

The UP/BNSF pilot used the Global Positioning System (GPS) as the primary positioning system, augmented with inertial guidance and odometers. This positioning system was able to determine the track on which the train is located and direction taken by the train at each switch. The digital data link was a 900 MHz data link for the UP and a 160 MHz link for BNSF. Utilizing both the 160 and 900 MHz networks to cover joint UB/BNSF territories provided interoperability. All movement authorities were generated at central dispatch and transmitted to the train via the digital data links, the trains reported their location and speed, in return, to dispatch. Enforcement of movement authority and speed limits occurred on board the locomotive.

B. The Alaska Railroad Corporation Project

Early in 1998, the Alaska Railroad Corporation (ARRC) launched a program to install a precision train control system throughout its rail network using equipment operating on the 900 MHz ATCS channel pairs. This FRA-sponsored project is a derivative of the UP/BNSF project described above. The ARRC project includes the deployment of a Track Forces Terminal (TFT) for roadway employees, which will provide location tracking of roadway workers on track vehicles and digital communications for obtaining and releasing work zones for the protection of roadway employees.

This centrally controlled system will provide for safe and efficient train

operations through increased track capacity, protection of roadway workers, speed enforcement and stop enforcement where stop is required. The AARC system is being installed in rugged Alaskan terrain and will enhance the safety of passenger and freight train operations across the railroad.

C. Illinois Department of Transportation Pilot Program

The early systems like the ARES (Advanced Railroad Electronics System) and ATCS (Advanced Train Control Systems), although never implemented for revenue service, set the stage for the other efforts such as UP/BNSF joint project in the Pacific Northwest and the North American Positive Train Control Joint Program. The Federal Railroad Administration, the Illinois Department of Transportation (IDOT) and the Association of American Railroads fund the Joint Program, which is estimated to cost approximately $60 million. The program's principal objective is to design, build, test, and install a PTC system on a 120-mile section of the Union Pacific Railroad from Springfield to Mazonia, Illinois. The program will also develop and recommend a set of PTC interoperability standards for industry adoption and long term maintenance, and will demonstrate application of these standards in the IDOT installation. A map of the IDOT installation is included with this petition at Appendix D.

IV. REPORT ON CURRENT DEPLOYMENT OF ATCS FREQUENCIES

The FCC's 1988 waiver concerning the ATCS channel pairs was in the context of rules governing Private Land Mobile Radio Service (PLMRS). Certain conditions were applied that are generic PLMRs requirements, including exclusivity and loading, which are related. Sufficient loading of a channel pair

will typically lead to de facto exclusive use of that pair within a geographic area. A typical PLMRs base station loading requirement, justifying or securing the de facto exclusivity of the channels assigned to that station, would be a minimum of 70 mobile users utilizing that base station on a regular basis. Although such a requirement may be appropriate for a local dispatch application – taxi, courier service, etc. – it is not an appropriate utilization measure in a railroad environment. Taking into account the dynamic nature of rail operations and varying traffic density in any given geographic region, the need for channel availability and the high degree of reliance on the RF link for the underlying safety of the system is constant and independent of the number of users.[9]

The 1988 waiver request identified several user entities and applications of the ATCS channels, and contemplated using the channels to "transfer large volumes of data between locomotives, work crews, and computerized control

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9 As used herein, the following definitions apply to rail operations, traffic density and the system. Rail operations means traffic flow and pattern, and traffic density (intensity of operations at a particular location or track segment) is analogous to number of users. "Through-train" operations exhibit linear flow as a train moves through the coverage of adjacent base stations and requires regular use of the RF channels. "Local train" operations would typically require RF channel access on a less frequent basis, using a single base station for most if not all of that train crew's tour of duty. A given base station, particularly in multiple-track territory, can be subjected to a mix of these traffic types. Traffic density fluctuates for any given base station during any particular period of time or season, and usage of the RF link can be subjected to sharp peaking in "rush hour" situations, or extreme peaking in response to anomalies and emergency situations. The system refers to the train control and management system that is dependent upon the RF channels for communication inclusive of these channels. The RF segment of the system consists of the base stations as well as the fixed and mobile users accessing the system via the base station.

center."[10] Proposed applications at that time included train routing, train position and locomotive "health" reporting, route integrity, overspeed enforcement, and pacing. All of this functionality has been deployed utilizing the six channel pairs to validate their suitability (successfully) over the course of ATCS testing as described above. Additionally, other applications have been and are being run over these channels: i.e., work order reporting and signal code control. Of the 1,069 constructed base stations and 1,551 mobile units, many are used for direct train control as originally foreseen, and others are used for signal code control, (i.e., the remote control of signal devices such as power switches and signals, which is distinctly a safety-related train movement control function).

Recent initiatives, as outlined in the previous section, have focused upon the increased utilization of the six channel pairs at 900 MHz under the specifications developed by the industry. System design requirements and performance evaluations associated with these initiatives have been predicated on the premise that these channels will not be subject to interference from other users. The current focus is to enhance spectral efficiency to accommodate both train control and business applications of these channels. Feasibility testing of other techniques to improve spectral efficiency (trunking and channel aggregation) would also presume a non-interference environment.

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[10] Order, supra, 3 FCC Rcd 427 (1988), at paragraph 4.

V. THERE ARE NUMEROUS ADVANTAGES OF A SINGLE GEOGRAPHIC LICENSE

A. Streamlined Licensing is Linked to Improved Rail Safety, as Promoted by the FRA and NTSB.

The National Transportation Safety Board (NTSB) has recommended the installation of positive train separation systems on the nations' railroads in the belief that such systems would significantly reduce the number of train collisions due to human error. The idea is not a new one. For over 70 years, there have been systems that can provide for automatic train control and train stopping, which are two of the principal features of PTC. The Interstate Commerce Commission ("ICC") required these systems to be installed on a portion of national rail network, largely where passenger trains were operated. But with the decline of intercity passenger traffic and the high cost to install and maintain such systems, the ICC allowed most of them to be removed. Coincident with these developments, the over-regulated railroads experienced financial difficulties, including major bankruptcies in the Northeast and Midwest. These conditions did not abate until after enactment of the Staggers Act in 1980, which began the economic renaissance the railroads have experienced over the last dozen years.

In the 1980s, the railroad industry in the U.S. and Canada sponsored the ATCS program, which had, as one of its objectives, a reduction in the occurrence of train control-related accidents. The FRA supported this effort, declining to mandate any particular technologies with the hope that evolution of the ATCS program would result in the implementation of a cost-effective PTC.

For the past several years, FRA has sponsored research and test programs to further the potential for the implementation of PTC. The FRA/IDOT/AAR joint program is one such effort. That program has specified the use of the 900 MHz frequencies for the communications links, based on the conviction that those frequencies will provide the most cost-effective and schedule-effective solution.

B. A Single Geographic License Enables More Efficient Administration

The single license approach will streamline the Commission's licensing process and will eliminate a large amount of application handling and processing by the Commission's staff. It will shift from the Commission to AAR the burden of maintaining a site-specific database of tower locations, a burden which AAR is willing and prepared to accept. In essence, the Commission will look to AAR as the holder of a single license for the railroad industry for these six channel pairs, for the geographic area specified in the license. This approach is entirely consistent with one of the key principles adopted on November 18, 1999, when the Commission issued its "Policy Statement for Spectrum Management", stating that it was seeking to "improve the efficiency of our assignment processes through streamlining and innovative techniques."

C. It Will Advance the FCC's Public Safety Goals.

Modification of hundreds of site-specific licenses into a single geographic-area license will promote another key principle articulated by the Commission in its Spectrum Policy Statement, namely, to "ensure that important communications needs, such as public safety, are met." As described above in

this petition, a primary objective of ATCS/PTC systems is to improve the safety of train operations. That goal will be enhanced by this licensing approach, which will give increased flexibility to AAR and the railroad industry for purposes of deploying future PTC facilities to meet important safety needs.

D. It Will Promote Full Spectrum Utilization.

Another key principle of the Commission's Policy Statement on Spectrum Management was to "ensure full utilization" of the spectrum resource. The single-license approach requested by AAR in this petition will accomplish that objective by allowing non-railroad users full access to these six channel pairs outside of the geographic boundary of the AAR license, i.e., anywhere in the United States beyond 70 miles from a railroad right-of-way.

E. It Will Achieve International Harmonization Between the U.S. and Canada Regarding Treatment of These Channels.

This approach will promote international harmonization by conforming the U.S. approach to licensing on these channels to the same licensing approach adopted by the Canadian government for the same channels used by the Canadian railroad industry. As described elsewhere in this petition, the transborder operation of railroads between the United States and Canada is, for many purposes, seamless and transparent. Insofar as the railroads in the United States and Canada share the same frequencies and a common technological platform for ATCS/PTC, it makes good sense for the spectrum licensing mechanisms used by each government to be harmonized, as well.

F. The Geographic Boundaries of the License Will Be Easily Identified.

The geographic boundaries of the proposed single license for ATCS/PTC licenses, as proposed herein by AAR, are based on the same approach used by Industry Canada for use of the same channels by the Canadian railroads, through RAC. The geographic area covered by the license, if portrayed on a map, would appear as a "ribbon" or a "swath" consisting of the length of all railroad rights-of-way in the United States, the width of which would be 140 miles (70 miles on each side of the right-of-way). This 70 mile "exclusion zone" is consistent with the technical specifications for use of frequencies in this band as set forth in Section 90.621 of the Commission's rules. AAR will provide the Commission with full access to a software program and related database (maintained by AAR through its wholly-owned subsidiary, Transportation Technology Center, Inc. ("TTCI")) that will identify, by latitude and longitude, all points in the United States that are inside and outside of the area of the geographic license requested herein, and will make access to the same computer database available to other frequency coordinators so that all non-railroad entities that are eligible for use of these channels may have access to them, through certified frequency coordinators, in areas beyond the boundaries of AAR's geographic license.

G. Spectrum Management and Frequency Coordination Will Be Enhanced

AAR's sublicensing of these channels to individual railroads will be accomplished effectively and efficiently by means of AAR's new "Spectrum

Management Tool Set," which is a set of processes, computerized RF propagation models, and databases used to determine which RF frequencies are used for various railroad functions, and how those frequencies are assigned to specific base stations along the railroad right-of-way, estimating communications demand, predicting RF coverage, and analyzing actual or anticipated interference levels.

The direct users of this system will be TTCI and each of AAR's member railroads. Indirect users of this system include other entities that coordinate with TTCI in its role as the frequency coordinator of the 160 MHz and 900 MHz channels that are subject to AAR's concurrence. The planned operating site for the "toolset" is Pueblo, Colorado, but users will have remote access via the Internet or private communications networks.

VI. CONCLUSION

Granting this petition will advance the public interest by streamlining the Commission's licensing process for the six PTC channel pairs, thereby eliminating a significant amount processing burden on the Commission's staff. It will also ensure that important public safety communications needs will continue to be met; enable full utilization of the spectrum resource by allowing non-railroad users full access to the six channel pairs outside the geographical boundary of the geographic license; and promote international harmonization by conforming the U.S. regulatory approach to licensing these channels to the same procedure adopted by the Canadian government for the same channels used by the Canadian railroads. At the same time, the processes proposed

herein for the administration of the single geographic license will allow railroads to locate new PTC facilities more efficiently and with greater flexibility, and will help ensure non-interference with the railroads' safety-critical communications datalinks. In light of these significant public interests benefits, AAR hereby respectfully requests that the Commission grant this petition.

Respectfully submitted,

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Appendix A: List of ATCS/PTC Base Station Locations and Call Signs
Appendix B: Map of 900 MHz ATCS/PTC
Appendix C: Excerpts from RSAC Report
Appendix D: Map of IDOT Demonstration Corridor

APPENDIX A

	Call Sign	St	Lat A	Lon A	Lat B	Lon B	Lat C	Lon C	Lat D	Lon D	Lat E	Lon E	Lat F	Lon F
1	WNKY530	AL	304135	880230	305514	880846	310557	881351	394754	1200538	374841	1214809	375608	1211615
2	WNKY531	AL	330329	873333	325240	874440	323857	881009	340539	1172749	340544	1172431	340616	1171948
3	WNKY553	AL	315446	874403	313645	874110	313245	875220	373712	1215517	391217	1214858		
4	WNKZ809	AL	324523	880146	304238	880233	333230	865030	404635	994433	404638	1001001	402757	964702
5	WPEF969	AL	330438	851509	330503	851604	330827	852149						
6	WPEF970	AL	330608	853111	330534	853258	330657	853354						
7	WPEF971	AL	331846	854458	331906	854523	331933	854612						
8	WPEF972	AL	332332	860207	332426	860217	332626	860444						
9	WPEF973	AL	331958	864158	331622	864803	331738	864906						
10	WPEF974	AL	331940	863003	332039	863158	332313	862026						
11	WPOY668	AL	343650	865918										
12	Van Buren	AR	322550	942038	352946	934852	352531	932948						
13	WNKY542	AR	362338	901416	342755	903331	344740	901429	341227	1182542	341306	1182857	341559	1183847
14	WNLA282	AR	333749	912342	3511817	913423	331215	923945						
15	WNUT725	AR	335508	930914	344054	923738	341332	915732						
16	WPPB616	AR	353625	911657	344634	921310	344305	921552						
17	WNKY612	AZ	351756	1130144										
18	WNKY613	AZ	415524	735707	414010	861545	410600	881800	473422	1165914			471955	1165318
19	WNKY889	AZ	353316	1132340	350544	1135423	350203	1142203						
20	WNKY915	AZ	351426	1113548	351200	1121213								
21	WNKY932	AZ	350727	1091142	345345	1095150								
22	WNKY933	AZ	351148	1113849			350117	1104137						
23	Gr Terrace	CA	340120	1171746	340617	1171916	342058	1172627	330843	852236	330916	852311	330643	853004
24	Hanford	CA	361610	1193841					332005	855736	331945	855804	331940	855828
25	WNKY742	CA	391821	1203342										
26	WNKY771	CA					335812	1170219						
27	WNKY925	CA	353720	1204112	351635	1203913	413824	1223111						
28	WNKY936	CA	395200	1051558	405712	1020853	403701	1051937						
29	WNKZ893	CA	340034	1180913	340114	1175832	335101	1173912						
30	WPGP240	CA	383504	1212834	394823	1202812	395300	1205640						
31	WPKW680	CA	341117	1174216	340538	1174120	340530	1173531						
32	WPKW681	CA	342856	1180447	341153	1182012	342439	1183221						
33	WPKW894	CA	331332	1172154	332242	1173405	332214	1173312						
34	WPLG228	CA	325017	1171456	325331	1171250	325233	1171025						
35	WPLG230	CA	341944	1183602	341541	1183929	341639	1184655						
36	WPLG231	CA	342100	1182425	341010	1181744	341040	1181839						
37	WPLG233	CA	333009	1173949	340353	1181326	340603	1181418	371136	763422	371131	763419	370743	763119
38	WPNW544	CA	335100	1173912	333249	1174028	333003	1173950	365114	812309				

39	WPOZ807	CA	340337	1174010	335752	1172242	382922	1212645						
40	WPPB617	CA	374410	1212454	384417	1211808	391821	1203342						
41	WNKY662	CO					394606	1045910						
42	WNKY769	CO	394726	1050001	395448	1051732	394348	1051403						
43	WNKY842	CO	384447	1045140			371338	1042511						
44	WNLA277	CO	384445	1045139	391635	1043835	381619	1043729						
45	WNKZ891	DC	385505	765849					454508	1203603				
46	WNKY563	DE	394653	753019	382438	822806	385732	842734						
47	WNLA200	DE	391728	753810	385525	753440	382722	753440						
48	KNNR229	FL	294625	813816	300105	814224	285516	811909	332332	862118	332047	863312	332051	864020
49	WNUT727	FL	274738	815839	280057	820710	275717	822326						
50	WPEF976	FL	291220	820652	291158	820748	291133	820512						
51	WPEF977	FL	293547	820515	293547	820514	292958	820608						
52	WPEF979	FL	301801	815731	303336	815011	303028	815250						
53	WPEF982	FL	300654	820247	301800	815832	301550	815921	412047	1120027				
54	KNNR227	GA	334816	842700	333529	843249	331811	843544	332023	865225	332059	865241		
55	WNKY789	GA	334507	842346										
56	WNKY790	GA	334752	842643										
57	WPEF980	GA	325050	843616	325121	843709	325140	843752						
58	WPEF981	GA	330224	845919	330238	845910	330201	850150						
59	WNKY718	IA	430254	911041	431729	910533	431102	915154						
60	WNKY728	IA	430436	941259	430840	950842	412946	903738						
61	WNKY729	IA	421947	902550	426048	903945	424650	910550						
62	WNKY730	IA	415033	901108	414705	901516	420350	901005						
63	WNKY731	IA	412328	910350	412925	903916	413557	902039						
64	WNKY733	IA	404106	930715	410110	922651	411812	914127						
65	WNKY734	IA	411206	915933	411915	911526	412427	910350						
66	WNKY741	IA			423824	904724	434434	875838						
67	WNKY891	IA	403151	913504	403724	912040								
68	WNKY878	ID					440016	1162441						
69	WNKY880	ID	425204	1123047	426516	1131118	424543	1195347						
70	WNKY881	ID	443058	1121046										
71	WNKY882	ID	432950	1150202	434724	1115809								
72	WNKY883	ID			423951	1113608								
73	WNLA245	ID	421902	111843	481620	1163300								
74	Buda	IL	411935	894039	412323	892712	412641	891854						
75	WNKY603	IL	383814	900804	402833	783215	393905	781045						
76	WNKY615	IL	391752	875936	402950	770808	404846	801942						
77	WNKY625	IL	414619	881544	422928	903828								
78	WNKY635	IL	410009	890718	410925	883934	413933	880103						
79	WNKY636	IL	405511	895524	405620	893749	405546	892943						
80	WNKY637	IL			403639	911029	404728	904650						
81	WNKY639	IL	392847	882323	390617	883310	384556	885121						
82	WNKY642	IL	400541	873919	402921	890023	400923	885644						
83	WNKY644	IL	370221	891133	383231	893645	382213	880337						
84	WNKY645	IL	383231	891153	382829	885632	382224	882209						
85	WNKY669	IL	415350	985446	415251	881157	415307	873822						
86	WNKY717	IL	421558	890554	422937	890233	440536	873925						
87	WNKY732	IL	422351	881054	421946	880133	415240	873820						
88	WNKY807	IL	410719	875408	412237	872747	414557	750311						
89	WNKZ806	IL	413836	883811										

141	WNKZ889	MA	421432	710358										
142	WNKZ890	MA	421631	712531					361536	971648	364758	984309	363539	985235
143	WNKZ958	MA	422123	710747	405739	735524	401242	843830						
144	WNKY562	MD	392936	772956	393905	775814	393839	774401						
145	WNKY564	MD	392604	762031	391841	773626	391842	773731						
146	WNKZ877	MD	390825	764457										
147	WNLA236	MD	393815	774409	405320	764749	403205	765748						
148	WPLF987	MD	393700	774422	391421	774618	385739	781240						
149	WNKW459	MI	423325	852656	425858	853955	421642	831025						
150	WNKW467	MI	424938	841303	424213	843721								
151	WNKY619	MI	421730	853436	401858	803550	413531	872730	485958	1161050				
152	WPJS899	MI	414808	862531	414831	861819	415404	861408						
153	WPJS908	MI	415952	860531	420339	860149	420644	855747						
154	WNKY721	MN	460445	951744	461910	952630	464906	955112						
155	WNKY723	MN	444419	925051	445614	930217	445758	931511						
156	WNKY724	MN	452203	944203	452323	944736	453031	950754						
157	WNKY725	MN	440240	913828	442300	920300	443414	923120	414227	873437				
158	WNKY781	MN	445849	931325										
159	WNKY782	MN	445653	900520										
160	WNKY783	MN	443936	931539										
161	WNKY817	MN	434006	925736					374521	844926				
162	WNKZ785	MN	445715	931430	452122	923743	451724	924307	455058	1124522	451341	1123750		
163	WNKZ826	MN	460545	962407	461713	960440	455328	952240						
164	WNLA257	MN	460412	933936	465450	955436	471840	955800						
165	Hunneywell	MO	393945	915103	390711	943508	372321	940131	332614	860626	332618	860824	332552	860941
166	WNKW483	MO	380415	753425	400549	771237	402035	762615						
167	WNKY568	MO	373010	894320	371018	893706	371309	893031	291533	812818				
168	WNKY595	MO	393945	915102	390711	943507	372321	940130						
169	WNKY720	MO			393333	935536	394745	933235						
170	WNKY766	MO	390819	943335										
171	WNKY775	MO	383746	901155										
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173	WNKZ813	MO	390728	943018			385313	942137	401358	963007	411031	961527	404847	964224
174	WNKZ816	MO	394223	925715	395111	923802	400143	922935	393334	950808	394704	964221	390325	951542
175	WNKZ817	MO	384159	901323	390657	943333	390819	943335						
176	WNKZ818	MO	391303	930342	392605	930120	393518	915048						
177	WNKZ819	MO	392542	922631	393518	915048	393952	912043						
178	WNKZ909	MO	400137	932634	402257	932007	461538	993245						
179	Calais	MT	480830	1044718	481200	1043152	480833	1042100						
180	Dodson	MT	482620	1081300	481732	1074337	482133	1075225						
181	Shelby	MT	483057	1114947	483432	1121350	483024	1115122	332513	940229	351332	904735	341422	925518
182	WPNZ863	MT	480152	1061853										
183	WNKW447	NC	360530	801305	354924	801424	354017	802744						
184	WNKZ821	NC	355816	825753	355319	824928	354355	802040						
185	WNKY819	ND	463745	973600	462638	972157	460413	965341						
186	WNLA247	ND	472719	990714	470538	981636	440321	933823						
187	WNKY572	NE	410237	975946	405537	982032	404844	985010	292257	820627	292435	820618	292208	820614
188	WNKY575	NE					400058	970709	330539	843425				
189	WNKY576	NE			414945	1033919								
190	WNKY577	NE	394403	945120										
191	WNKY583	NE	410132	985436	420543	1025209	401506	993813	325352	844309	325432	844433	330126	845812

192	WNKY586	NE	401615	1000951	400247	1013154	401038	1010030	330147	850504	330156	850715	330201	850829
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195	WNKZ985	NE	410743	1023051	411113	1030259	411643	1034634						
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208	WNKY528	NY	422143	733553	383807	753652	403930	741050	340353	1171931				
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216	WNKY557	OH	394002	825107	390800	843221	404746	800609						
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218	WNKY611	OH	395930	825828	405135	795306	403425	804004						
219	WNKY617	OH	395550	834619	404751	854851	393625	820548						
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221	WNKZ914	OH	405220	843520										
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224	WNLA230	OH	395306	832628	395953	824505	402308	795116	463504	1181404	460613	1190740	460806	1225525
225	WPFN574	OH	413450	832938	414120	833010	413743	832947						
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228	WPOY679	OH	410636	834449										
229	Purcell	OK	350017	972127	342400	970322	342620	971222	351649	930807				
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231	WNKY895	OK	342232	970807	335838	971016	361653	965845						
232	Rowena	OR	454037	1211634	453554	1211013	454049	1205446	334341	932824				
233	WNKY795	OR	423600	1232200	421940	1225224	421159	1224219						
234	WNKY796	OR	454152	1225431										
235	WNKY798	OR	452615	1180527			454005	1184822						
236	WNKY800	OR	432221	1230347					390209	945856	374342	971911	390409	943853
237	WNKZ910	OR	432426	1241446	422612	1231907	424250	1232401						
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239	WNKZ933	OR	452717	1234957	451250	1234512	440420	1230805						
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251	WNKY556	PA	401237	795416	402552	800026	402608	795956	391918	1202007	410031	1174608		
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259	WNKY616	PA	402722	795424	401940	791830	401850	792330						
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332	Petersburg	VA	371050	772623	364340	763423								
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113	WNKY600	IN	382843	871702	385055	821108	391855	820820						
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139	WNUT726	LA							311626	922624	322900	920710		
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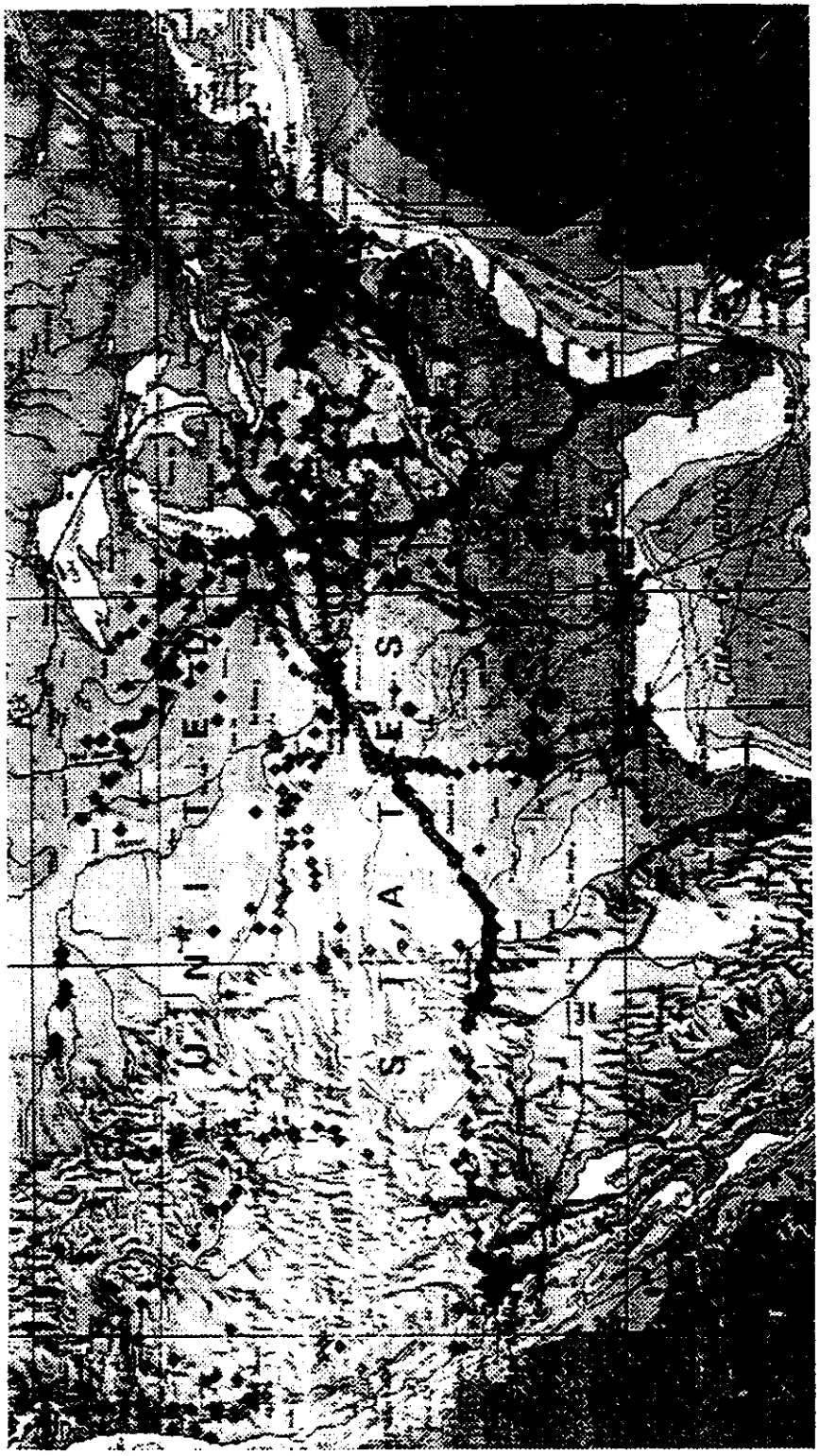
APPENDIX B



CURRENT AND PENDING AAR 900 MHZ BASE STATIONS

Excerpts From

"REPORT OF THE RAILROAD SAFETY ADVISORY COMMITTEE (RSAC) TO THE FEDERAL RAILROAD ADMINISTRATION ON THE STATUS AND FUTURE OF POSITIVE TRAIN CONTROL (PTC) SYSTEMS"

Washington, D.C.

August 1999

[*Excerpts consist of:* Table of Contents and Executive Summary, Conclusions and Recommendations]

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