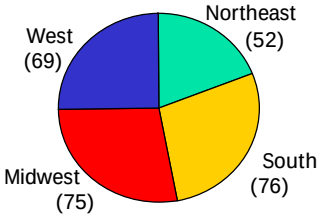
Key Results of the Survey of Wireless Capabilities in Public Transit
December 2007

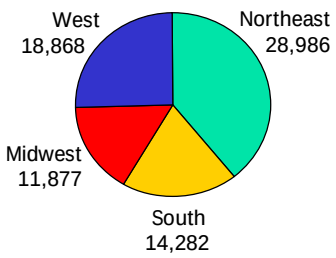
The major national public transit industry associations, the American Public Transportation Association (APTA), and the Community Transportation Association of America (CTAA), are working together to assess the current status and future wireless communications needs of the transit industry. Ongoing and expected future Federal Communications Commission (FCC) changes in the licensing of radio frequency spectrum raised concerns regarding the extent to which the public transit industry will be affected by these rule changes. To assist APTA and CTAA as they address these concerns, SAIC was contracted by the Transit Cooperative Research Program (TCRP) to conduct a survey of the U.S. public transit industry's wireless communications capabilities.

Data collection for this assessment was through a web-based survey. APTA and CTAA transit members were e-mailed invitations to take this survey in February 2007 and August 2007. Survey collection was closed in October 2007, with a total of 272 completed surveys. The number of responding agencies and the number of vehicles they represent is shown in the graphs below for the major U.S. geographic regions.

Number of Agencies Responding (Total = 272)



Number of Vehicles Represented (Total = 74,013)

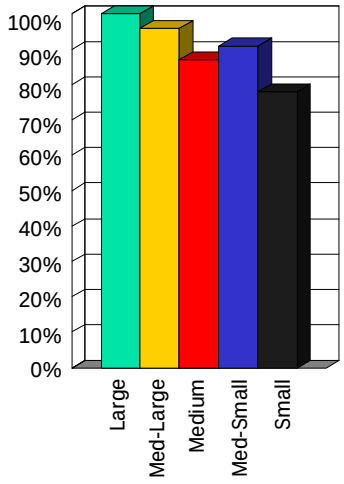


Fleet size categories used in this analysis were based on the number of reported vehicles, vessels, and / or rail cars. The ranges for each size category are as follows:

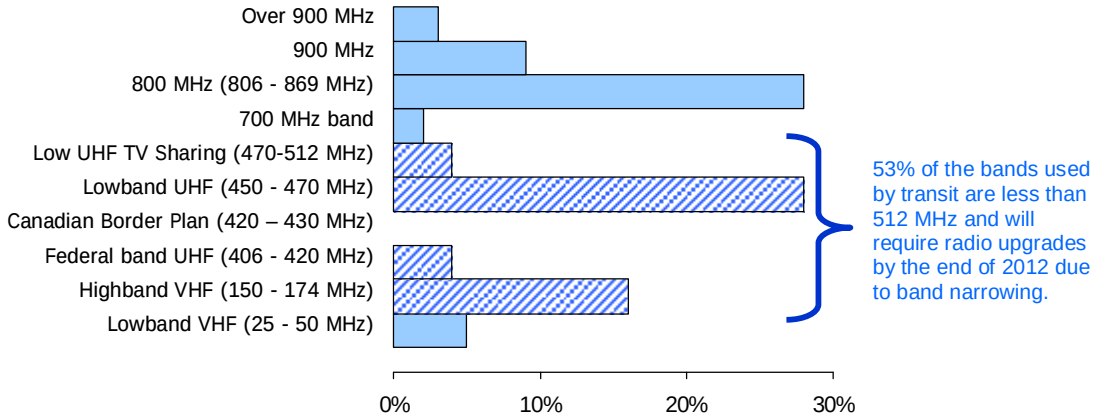
Large = 500 or more
Med-Large = 100 to 499
Medium = 50 to 99
Med-Small = 20 to 49
Small = less than 20

Two-way radios, also referred to as private land-mobile radios (LMR), operate in the radio spectrum using licensed and unlicensed channels regulated by the FCC. Overall, 89% of the transit agencies surveyed use LMR. As shown in the graph to the right, LMR use generally declines with fleet size, with all surveyed large fleets using two-way radio, and 78% of small fleets using two-way radio.

Percent of Transit Agencies that Use Two-Way Radios



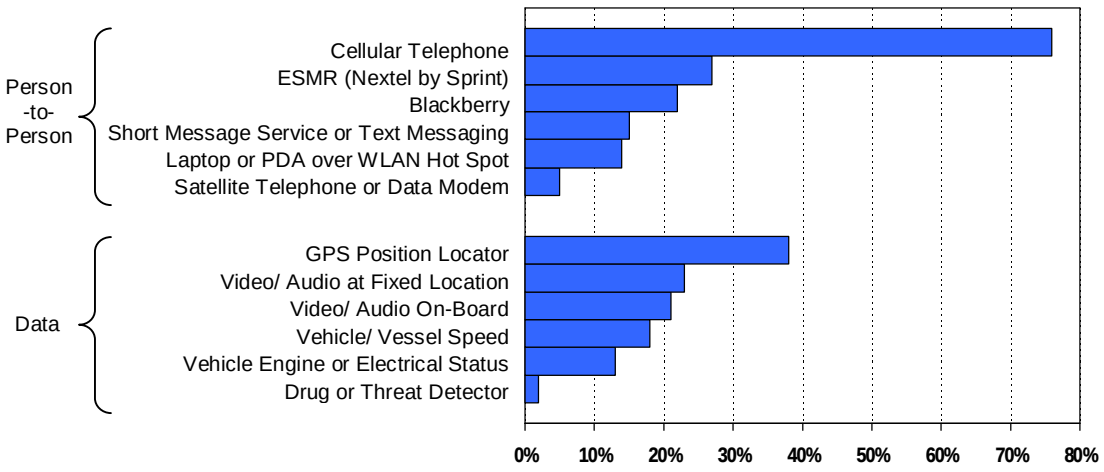
Radio Frequency Bands used by Transit Agencies
(Striped bars indicate bands between 150 and 512 MHz that will require radio upgrades by the end of 2012)



The above graph shows which radio frequency bands are used by transit agencies. The 53% of public transit agency bands that use radio frequencies between 150 MHz and 512 MHz is of particular interest because the FCC has mandated that by the end of 2012, all LMR operating between these frequencies must change from using a single 25 kHz wide channel to channels that are 12.5 kHz wide. This change requires all current radios operating 25 kHz analog channels between 150 and 512 MHz to be modified, upgraded, or replaced with radios that have more advanced technology allowing the same amount of analog voice intelligence that was sent in 25 kHz, to be sent in 12.5 kHz. The FCC has suggested further channel narrowing to 6.25 kHz using digital technology with a target date of 2018. The purpose of the narrowing of radio channels from 25 kHz to 12.5 kHz also referred to as "narrow banding" and "refarming", is to allow more users of the radio spectrum with less interference than is now possible as a result of technological advances. The FCC is also re-organizing the 700 and 800 MHz bands, which may affect another 30% of current transit agency bands.

In addition to LMR, the transit industry is using radio spectrum for other technologies. Usage of other person-to-person and data communications technologies is shown in the graph below.

Percent of Transit Agencies that Use Other Technologies that Use Radio



The Transit Cooperative Research Program is conducting research in support of APTA and CTAA as they develop an industry plan to address changing communications technologies and assist transit agencies in responding to changes in FCC licensing rules.

This summary was prepared by SAIC in appreciation of the industry's participation in the survey, conducted under the Transit Cooperative Research Program, Project J-06, Task 67, Strategic Assessment of Wireless Capabilities and Needs for the Public Transportation Industry. More detailed information is available through the Transportation Research Board.