58 is placed in use. Only if task 116 was unable to find a free channel 58 and task 120 was unable to find an out-of-use reuse unit 62 containing a free channel 58 can a conflict exist. In that case, a decision task 124 is performed.

Task 124 determines if FIFO buffer 100 is the buffer pointed to. If FIFO buffer 100 is the pointed-to buffer, then the channel usage request being processed is a new call request. In this case, a task 126 refrains from assigning a channel 58. Therefore, channel 58 is assigned to a new call only if that assignment would not result in a channel assignment conflict. New call requests have the lowest priority of any channel usage request, based upon the assumption that it is better to properly service existing calls than to unnecessarily deteriorate existing call service to initiate new calls. In other words, it is better to make a new caller wait briefly, or even receive a busy signal, than it is to unnecessarily risk disconnecting a call already in progress.

Besides refraining from allocating a channel 58, task 126 may optionally refrain from removing the new call request from FIFO buffer 100. If the new call request is left in FIFO buffer 100, then processing can return to primary process 68, with the new call request intact, ready to try again next time. Of course, those experienced in the art will readily recognize that several different schemes (e.g., timeout, iteration counting, etc.) may be implemented to prevent the development of an infinite loop in which a new call request would never be processed.

If task 124 determines that FIFO buffer 96 or 98 is the pointed-to buffer, and that the channel usage request is either an inter-cell or an intra-cell handoff request, a task 128 is performed. In task 128, parent base station 36 selects a neighbor base station 38 within local group 34 that, according to table 70, has less call traffic than parent base station 36. Ideally, the neighbor base station 38 selected would be that with the least call traffic (the least loaded), but as those skilled in the art may readily perceive, this is not required.

Once task 128 has selected a neighbor base station 38 with less call traffic, then a task 130 places a reuse unit 62 in use at parent base station 36 that creates a conflict with the selected neighbor base station 38. After task 130 has placed in use a conflicting reuse unit 62, processing loops back to task 116 and continues as already described, ultimately returning to primary process 68. A channel 58 from this conflicting reuse unit 62 will be placed in use at task 118.

Upon completion of subprocess 104, process control returns to primary process 68 in FIG. 5, and loops back to task 72, making process 68 continuously iterative.

As discussed above, all base stations 22 in system 20 are parent base stations 36 of their own local groups 34. Because of this, all base stations 22 in system 20 are continuously and concurrently performing process 68, and subprocesses 80 and 104. In the scheme used in this embodiment, no call is handed off between base stations 22 to address conflicts. Calls are always accepted by the base station 22 receiving the request, and it is the resolution of a conflict that is handed off to a lesser-loaded base station 22 in pairs of conflicting base stations 22. In this manner, those base stations 22 with greater workloads are protected from unnecessary increases in their workloads to resolve conflicts. At the same time, those base stations 22 with lesser workloads are obliged to resolve conflicts which, because of their lesser workloads, they are better equipped to do, and, because of their lighter traffic load, are more likely to successfully achieve.

In summary, channel management process 68, together with its tasks and subprocesses, allocates a non-conflicting (free) channel 58 to a parent base station 36 in response to a channel usage request if possible. If a non-conflicting channel 58 cannot be allocated, then a conflicting channel 58 is allocated if and only if the channel usage request is either an inter-cell or an intra-cell handoff request. It does not allocate a conflicting channel 58 if the channel usage request is a new call request. In the event of channel assignment conflicts between base stations 22, the conflict is resolved in the base station 22 that has the lesser loading.

Although the preferred embodiments of the invention have been illustrated and described in detail, it will be readily apparent to those skilled in the art that these embodiments include processes that have a wide variety of tasks sequenced in a wide variety of patterns to achieve results equivalent to those described herein. In addition, those skilled in the art will understand that the present invention is not limited to satellite cellular systems, and that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

What is claimed is:

1. A method for managing channel usage at a first base station in a radio telecommunication system, said method comprising the steps of:

(a) receiving data which identify channels in use at a second base station;

(b) obtaining a channel usage request, said channel usage request requesting use of a channel at said first base station;

(c) determining whether said second base station is carrying less call traffic than said first base station; and

(d) if said second base station is carrying less call traffic, using a channel at said first base station which is in use at said second base station.

2. A method as claimed in claim 1, wherein said step (b) obtains a plurality of channel usage requests, and said method additionally comprises the steps of:

sequentially processing said channel usage requests by performing said step (c) and said step (d) for each of said channel usage requests; and

prioritizing said channel usage requests to indicate an order in which to sequentially process said channel usage requests.

3. A method as claimed in claim 2, wherein:

said method additionally comprises the step of evaluating data which characterize said channel usage requests as inter-cell handoff requests and intra-cell handoff requests; and

said prioritizing step gives priority to processing said inter-cell handoff requests before processing said intra-cell handoff requests.

4. A method as claimed in claim 3, wherein:

said evaluating step evaluates data which characterize said channel usage requests as inter-cell handoff requests, intra-cell handoff requests, and new call requests; and

said prioritizing step gives priority to processing said inter-cell handoff requests and said intra-cell handoff requests before processing said new call requests.

5. A method as claimed in claim 2, wherein:

said method additionally comprises the step of evaluating data which characterize said channel usage requests as handoff requests and new call requests; and

said prioritizing step gives priority to processing said handoff requests before processing said new call requests.