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EX PARTE

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. Room 222
Washington, D.C. 20554

RE: CC Docket Nos. 96-45 and 97-160

Dear Mr. Caton,

The attached information is submitted by the joint sponsors of the Benchmark Cost Proxy Model (BCPM). The attached information are preliminary results of the BCPM runs for the Gunnison and Hayden, Colorado wire centers.

The attached preliminary results for the BCPM2.0 Alpha Version includes the new Grid data and Engineering logic.

In accordance with Commission Rule 1.1206(a)(1), the original and three copies of this is being filed with your office. Acknowledgment and date of receipt are requested.

If there are any questions, please call on the above telephone number.

Sincerely,

Warren D. Hannah

Warren D. Hannah

Attachment

c: Mr. Charles Keller, FCC, Washington, D.C (5 copies)

BCPM2.0 Alpha Version

Preliminary Results Package for FCC Ex-parte
Gunnison and Hayden Colorado

(The User Interface, Logic, Inputs, and Outputs from this version are Preliminary and subject to Change. This release is intended as only to allow review of the BCPM2.0. System run times are slow and User Interface features are in progress.)

Release 2.0 of the BCPM includes the new Grid data and Engineering logic. The switching, interoffice, expense and capital cost logic are based on the BCPM1.1. All inputs, except for capital cost (based on FCC 11.25% return and FCC Depreciation ranges), are based on BCPM1.1.

The intention of this package is to provide the staff of the FCC and Joint Board with the new logic and the development process of the new grid data. We have also included preliminary runs for Gunnison and Hayden, Colorado. Please not that although the model produces results, they have not been adequately tested nor do they represent the values that will result from the final model.

Attachment 1:
- Grid Data Processing Steps
  (Actual Source Code will be filed ASAP)

Attachment 2:
- Grid Data File Definition
  - Includes Layout and Source

Attachment 3:
- Dump of BCPM2.0 Alpha Version Excel Logic

Attachment 4:
- BCPM2.0 Alpha Version results
  - Gunnison, Colorado
  - Hayden, Colorado

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ATTACHMENT 1

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BCPM2 Processing Steps

This paper describes the steps in processing BCPM2 data. Processing occurs state-by-state.

Step 1: Create Appropriate Wire Center Service Areas Table

Program: MapBasic **B2WCSA**
Tables/Files Used: ***CDDrive:\\aa\aa*WCSA**, BLR wire center boundaries
Tables/Files Produced: ***basepath\aa\aa*WCSA,** Effective BLR wire center boundaries

This program selects wire center boundaries for which the central office is *within* the state. It sorts them into CLLI-8 ascending order and writes the resulting table to the base directory.

Step 2: Determine Counties Covered by Wire Centers of a State

Program: MapBasic **B2WCCNTY**
Tables/Files Used: ***basepath\aa\aa*WCSA**, wire center boundaries
***basepath*\USCNTYHR**, high resolution county boundaries
Tables/Files Produced: ***basepath\aa\aa*WCCOS.TXT**, ASCII text list of counties required

This program determines the counties covered by a state's wire centers. These will typically be all counties of the subject state, but can also be several counties from one or more adjacent states.

The program considers a county should to be included if at least 2% of that county's area is intersected by the set of wire center boundaries for the state.

The resulting ASCII text file is produced in ascending state/county FIPS code sequence.

Step 3: Generate 1/200th Degree Grid Cells for Each Wire Center Service Area

Program: MapBasic **B2WCGRID**
Tables/Files Used: ***basepath\aa\aa*WCSA**, wire center boundaries
Tables/Files Produced: ***basepath\aa\aa*WCGR**, grid cells for all wire centers of the state
***basepath\aa*\B2LOG**, ASCII text log file of errors encountered

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The ***aa*WCGR** table consists of 1/200th degree grid cells as MapInfo regions, each of which is (if necessary) cut to precisely fit within wire center boundaries ... thus not all of these regions are true "square" grids.

Each record of this table contains the CLLI code of its wire center, and the latitude and longitude of the numerical centerpoint of the grid cell that is represented by the record.

Mutually distinct parts of the same 1/200th degree grid may appear in different (adjacent) wire centers.

The resultant records are in order by wire center (whatever the order of the input ***aa*WCSA** table), and within a wire center's area, by ascending latitude (major) and ascending longitude (minor).

If MapInfo has an error when cutting the grid cells, a log – **B2aaLOG** – is produced indicating the failing wire centers. The MapBasic program **B2WCGR01** must be run for each failed wire center. When the expected *Error Overlaying the Objects* message appears, ***Append Table***, from ***Selection*** to ***WCGR***. Then ***Save Table*** the ***WCGR*** table. Then ***Close All***, discarding changes to the ***WCGRTEMP*** table. When these additions have been performed, the table must then be resorted in ***WCCLLI***, ***CentLat***, ***CentLng*** sequence, then saved. This sorted, amended table must then replace the original ***aa*WCGR** table.

Step 4: Set Area of Grid Cells, and Find and Correct any Malformed Grid Cells

Program: MapBasic **B2FXWCGR**
Tables/Files Used/Affected: ***basepath\aa\aa*WCGR**, grid cells for wire centers
Tables/Files Produced: ***basepath\aa*\B2LOG**, ASCII text log file of errors encountered

This program updates the *AreaSqMi* column of the ***aa*WCGR** table. Having done so, it examines the area of each grid cell, looking for impossibly large grids malformed by the previous process.

Any malformed grid cell is *replaced* by this program with a purely rectangular 1/200th degree cell (this can overlap another cell, but the total amount of overlapped area will be miniscule). For any malformed/replaced grid cell, a record is written to the log.

Step 5: Fully Format the Grid Cell Records

Program: MapBasic **B2FMWCGR**

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Tables/Files Used/Affected: ***basepath\aa\aa*WCGR**, grid cells for wire centers

This program just adds all additional columns in the ***aa*WCGR** table required for succeeding processes.

Step 6: Determine the Switches for the Wire Center Service Areas

Program: MapBasic **B2WCSWS**
Tables/Files Used: ***basepath\aa\aa*WCSA,** wire center service area boundaries
***basepath*\LERG7X**, all switches defined in LERG
Tables/Files Produced: ***basepath\aa\aa*WCSWS**, switches for state wire centers

This program determines the switches that qualify. There may be more than one per wire center boundary. But there *must* be at least one per wire center boundary ... if there is not, the program issues an error message.

Step 7: Assign the Switches to the Wire Center Grid Cells

Program: MapBasic **B2GRSW**
Tables/Files Used: ***basepath\aa\aa*WCSWS,** switches for state wire centers
Tables/Files Used/Affected: ***basepath\aa\aa*WCGR**, wire center grid cells

This program determines the switch for each microgrid cell, assigns it to that cell, and sets the distance of the physical centroid of that cell from its assigned switch. If any of the original wire center boundaries was *split* by this process, the program reorders the table to assure that it retains sequence by ***WCCLLI, SWCLLI, CentLat, CentLng***.

Step 8: Assign the Minimum Bounding Rectangle for Each Switch's Area

Program: MapBasic **B2SWMBR**
Tables/Files Used: ***basepath\aa\aa*WCGR,** wire center grid cells
Tables/Files Used/Affected: ***basepath\aa\aa*WCSWS**, switches for state wire centers

This program determines, from the assigned grid cells, the minimum bounding rectangle (MBR) for the area covered by each of the switches, and updates the switches file with those 4 values.

Step 9: Collect the Terrain Data for All States Served by This State's Wire Centers

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Program: MapBasic **B2BGTRN**
Tables/Files Used: ***CDdrive:\CBGSOILS\aa*BGSOILS**, Terrain Data by Block Group
Tables/Files Produced: ***basepath\aa\aa*WCSOIL**, terrain data for all block groups served

This program uses the Stopwatch Maps *State Terrain Data by Census Block Group* product as its source. It copies to a table on hard disk the terrain data for all block groups of all states served by this state's wire centers. That table is used in the next step.

Step 10: Assign Terrain Data to Each Grid Cell

Program: MapBasic **B2GRTRN**
Tables/Files Used: ***basepath\aa\aa*WCSOIL**, terrain data for all block groups served
Tables/Files Used/Affected: ***basepath\aa\aa*WCGR**, wire center grid cells

This program joins information in these two tables, writing it to a temporary table on the local drive **C:\TEMP\GRBGX**. It then updates the WCGR table with that information.

Typically, however, this program ends with an *Error Overlaying Objects* after storing the work file. In that case, assure that the work file *is* stored, then *Close All*, then run the DOS program **B2GRBG2**. Run it from the base directory, with two arguments: state abbreviation ad base path.

Step 11: Collect the Census Block Boundaries for the State's Wire Centers

Program: MapBasic **B2ALLCBS**
Tables/Files Used: ***basepath\aa\aa*WCCOS.TXT**, ASCII text list of counties required
CDdrive:\CBBY\aa\CBssccc, Census Block Boundary tables on CD
***basepath\aa\aa*WCSA**, wire center service areas
Tables/Files Produced: ***basepath\aa\aa*WCCBS**, Census Block Boundaries for all these WCs

This program uses the list of counties required to direct the operator to mount the one or more CD-ROMs containing the Census Block boundaries for the required counties (some of which may be outside the subject state). It produces a table of all Census Block boundaries within the purview of the subject state's wire centers.

Step 12: Collect the Census Block-Level Housing Data

Program: DOS Batch File **B2CBDEMS.BAT**

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DOS C-Program **C:\UTIL\CSVTOTAB.EXE**, plus other utilities
Tables/Files Used: ***basepath*\BXDEMS.DEF**, ASCII text file definition
CDdrive:*\XBLK\BX*ssccc, STF1B extract files
Tables/Files Produced: ***basepath\aa\aa*CBDEMS**, Census Block housing demographics

This batch file, file conversion utility program, and assorted other utility programs generate a table containing, for each occupied Census Block in any county (of any state) touched by one of this state's wire centers, the base housing demographics, including a 3-way distribution of housing units by structure size. At this point, this is unadjusted 1990 Census data.

Step 13: Collect the Block Group-Level Units-in-Structure Distribution Data

Program: MapBasic **B2BGHUS**
Tables/Files Used: ***CDdrive:*\BLOCK\REP*aa*G01**, Claritas BG Units in Structure by State
Tables/Files Produced: ***basepath\aa\aa*BGHUS**, resulting table for all BGs touched by WCs

This program copies the BG-level units-in-structure data, for Block Groups in all states touched by this state's wire centers, to a table, in FIPS order.

Step 14: Apply All Housing Unit Demographics to Census Block Table

Program: MapBasic **B2UPCBHU**
Tables/Files Used: ***basepath\aa\aa*CBDEMS**, Census Block housing demographics
***basepath\aa\aa*BGHUS**, BG units-in-structure
***basepath*\POPADJ.TXT**, 1995 census adjustment factors by county
Tables/Files Affected: ***basepath\aa\aa*CBS**, Census Blocks table

This program applies the housing unit information from the above tables and file to the Census Blocks.

Step 15: Collect the Business Lines/Firms Data from PNR

Program: DOS Batch File **B2PNRBUS**
DOS C-Program **C:\UTIL\CSVTOTAB.EXE**, plus other utilities
Tables/Files Used: ***basepath:\aa\aa*_BLOCK.CSV**, PNR CB-level businesses
***basepath:\aa\aa*_BG.CSV**, PNR BG-level businesses
***basepath:\aa\aa*_TRACT.CSV**, PNR TR-level businesses

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Tables/Files Produced: ***basepath\aa\aa*PNRCB**, CB-level businesses for state
***basepath\aa\aa*PNRBG**, BG-level businesses for state
***basepath\aa\aa*PNRTR**, TR-level businesses for state

This process assumes that the PNR CSV files have already been unZIPped to the appropriate state subdirectory in the base path. These are the business lines/firms for the specific state only.

Step 16: Apply Business Lines/Firms Data to Census Block Table

Program: MapBasic **B2UPCBBU**
Tables/Files Used: ***basepath\aa\aa*WCCOS.TXT**, ASCII text list of all counties touched
***basepath\ss\ss*PNRCB**, CB-level businesses for all states touched
***basepath\ss\ss*PNRBG**, BG-level businesses for all states touched
***basepath\ss\ss*PNRTR**, TR-level businesses for all states touched
Tables/Files Used/Affected: ***basepath\aa\aa*CBS**, Census Blocks table

This program first collects PNR data for all counties touched into work files **C:\TEMP\PNRCB, C:\TEMP\PNRBG,** and **C:\TEMP\PNRTR**, sorted to FIPS order. It then applies that data to the Census Blocks file.

Step 17: Collect the Roads for a State's Wire Centers as MID/MIF Files

Program: DOS Batch File **B2TGRMIF**
DOS C-Program **B2TGRRDS.EXE**, plus other utilities
Tables/Files Used: ***basepath\aa\aa*WCCOS.TXT**, ASCII text list of all counties touched
CDdrive:*\TIGER94*x**ss*\CB*ssccc.xxx, TIGER94 files
Tables/Files Produced: ***basepath\aa\aa*STS*ssccc*.MID/MIF**, importable files per county

This process creates, from TIGER94 CDs, the roads for all counties (in all states) touched by this state's wire centers.

Step 18: Import Roads MID/MIF Files to a MapInfo Table

Program: MapBasic **B2ALLRDS**
Tables/Files Used: ***basepath\aa\aa*WCCOS.TXT**, ASCII text list of all counties touched
***basepath\aa\aa*STS*ssccc*.MID/MIF**, importable files per county
Tables/Files Produced: ***basepath\aa\aa*RDS**, Census Blocks table

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This program imports and collects all the above files into a single MapInfo table. When you are satisfied that the process is successful, you may erase the MID/MIF files, and the temporary ***aa*RD0** table.

Step 19: Relate Roads and Census Blocks

Program: DOS C-Program **B2CBRDS**
Tables/Files Used/Affected: ***basepath\aa\aa*RDS**, roads for the entire state
***basepath\aa\aa*CBS**, Census Blocks table

This DOS program (whose two parameters are *StateAbbr* and *BasePath*) determines and posts the total road segment lengths for each Census Block, and tags the Roads records with the WCCLLI code of the Census Block and the indication as to whether the CB is large, small, or empty.

Step 20: Create the Valid Roads Table and the Roads-In-Large-Census-Blocks Table

Program: MapBasic **B2SPLRDS**
Tables/Files Used: ***basepath\aa\aa*RDS**, roads for the entire state
***basepath\aa\aa*CBS**, Census Blocks table
Tables/Files Produced: ***basepath\aa\aa*VLDRDS**, valid roads for state
***basepath\aa\aa*LCBRDS**, roads for state in large Census Blocks

This program creates the two working Roads tables from the original.

Step 21: Determine Area Overlap of Smaller Census Blocks with Grid Cells

Program: MapBasic **B2SCBXGR**
Tables/Files Used: ***basepath\aa\aa*CBS**, Census Blocks table
***basepath\aa\aa*WCGR**, wire center grid cells
Tables/File Produced: ***basepath\aa\aa*SCBxGR**, small Census Block/microgrid join

This program determines the area overlap between microgrid cells and Census Blocks less than 0.25 square miles in size. This relationship will be used in the next step to allocate demographics from those Census Blocks to the overlaid grid cells.

If MapInfo stops this program with an *Error overlaying the objects*, you should save the SCBXGR temporary table as ***basepath\aa\aa*SCBxGR** and end the program.

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Step 22: Allocate Demographic Data from Small Census Blocks to Microgrids

Program: DOS C-Program **B2ALLOSM.EXE**
Tables/Files Used: ***basepath\aa\aa*SCBxGR**, small Census Block/microgrid join
***basepath\aa\aa*CBS**, Census Blocks
Tables/Files Affected: ***basepath\aa\aa*WCGR**, wire center grid cells

This program uses the relationships determined above to add area-proportional Census Blocks demographics to the overlaid grid cells.

Step 23: Determine Road Segment Overlap of Larger Census Blocks with Grid Cells

Program: MapBasic **B2LCBXGR**
Tables/Files Used: ***basepath\aa\aa*LCBRDS**, large Census Block road segments
***basepath\aa\aa*WCGR**, wire center grid cells
Tables/File Produced: ***basepath\aa\aa*LCBxGR**, large Census Block road/microgrid join

This program determines the area overlap between microgrid cells and road segments of Census Blocks larger than 0.25 square miles in size. This relationship will be used in the next step to allocate demographics from those Census Blocks to the overlaid grid cells.

If MapInfo stops this program with an *Error overlaying the objects*, you should save the LCBXGR temporary table as ***basepath\aa\aa*LCBxGR** and end the program.

Step 24: Allocate Demographic Data from Large Census Blocks to Microgrids

Program: DOS C-Program **B2ALLOLG.EXE**
Tables/Files Used: ***basepath\aa\aa*LCBxGR**, small Census Block/microgrid join
***basepath\aa\aa*CBS**, Census Blocks
Tables/Files Affected: ***basepath\aa\aa*WCGR**, wire center grid cells

This program uses the relationships determined above to add road-length-proportional Census Blocks demographics to the overlaid grid cells.

Step 25: Calculate Road Information for Micro-grids

Program: MapBasic **B2RDNFO**
Tables/Files Used/Affected: ***basepath\aa\aa*VLDRDS**, Valid Roads table

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***basepath\aa\aa*WCGR**, wire center grid cells

This program calculates the road centroid, total length of intersecting roads, and the road area for each Micro-grid.

Step 26: Aggregate Micro-grids

Program: DOS C-Program **B2WCAGG**
Tables/Files Used/Affected: ***basepath\aa\aa*WCSWS**, switches for state wire centers
***basepath\aa\aa*WCGR**, wire center grid cells
Tables/Files Produced: ***basepath\aa\aa*AGG**, aggregate grids

This program aggregates the Micro-grids based on the algorithm described in the BCPM2 Model documentation. For each group of aggregated Micro-grids, a record with a Wire-Center-unique aggregate grid ID and the aggregated values are output to the *aa*AGG table. Additionally, each Micro-grid is tagged with the aggregate grid ID.

Step 27: Calculate Feeder Information for Aggregate Grids

Program: DOS C-Program **B2WCFDR**
Tables/Files Used/Affected: ***basepath\aa\aa*WCSWS**, switches for state wire centers
***basepath\aa\aa*AGG**, aggregate grids
Tables/Files Produced: ***basepath\aa\aa*FNFO**, feeder information

This program calculates the feeder lengths and FDI code for each aggregate grid. The table *aa*FNFO contains main feeder-angle information for each wire center that is necessary for creating MapInfo maps for the feeders.

Step 28: Generate the Primary Output CSV File

Program: MapBasic **B2OUTCSV**
Tables/Files Used/Affected: ***basepath\aa\aa*AGG**, aggregate grids
Tables/Files Produced: ***basepath\aa\aa*OUT.CSV**, primary comma-separated variables file
***basepath\aa\aa*OUTZ.CSV**, empty records of the above file

This program sorts the AGG table into FDI Code within Switch CLLI. It generates the CSV file, creating where necessary a special record to reflect the split of a main feeder at 10,000 feet.

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Step 29: Generate the Wire Center Terrain CSV File

Program: MapBasic **B2TRNCSV**
Tables/Files Used/Affected: ***basepath\aa\aa*WCGR**, micro-grids
Tables/Files Produced: ***basepath\aa\aa*WCTRN.CSV**, comma-separated variables file

This program generates the record for each switch, in switch CLLI order, summarizing the terrain characteristics of the service area.

Step 30: Generate the Wire Center Info CSV File

Program: MapBasic **B2INFCSV**
Tables/Files Used/Affected: ***basepath\aa\aa*WCSWS**, switches in wire centers
***basepath*\TELCOS**, all telephone companies' file
Tables/Files Produced: ***basepath\aa\aa*WCINF.CSV**, comma-separated variables file

This program generates the record for each switch, in switch CLLI order, summarizing the ownership characteristics of the service area.

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ATTACHMENT 2

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Data for BCPM2 Model

8/22/97

The following summarizes the data to be provided for the BCPM2 model. This data is provided as a set of comma-separated variable ASCII text files. For each of 50 states (in Alaska, for the Anchorage area only), the District of Columbia, and Puerto Rico, the following 4 files are produced:

- Base Grid File: Fundamental file, containing attributes and measures for each grid
- Wire Center Terrain File: Auxiliary file, containing terrain attributes of the service area
- Wire Center Information File: Cross reference for wire center as a whole
- CBG-to-Grid Equivalence: Cross reference for CBGs in a service area

In addition, a nationwide Telephone Companies File relates each operating company to its parent company.

Each comma-separated variable file presents character fields <u>without</u> surrounding quotation marks. Spaces freely appear in such character fields, but commas and ampersands <u>never</u> do. When either a comma or ampersand appears in the original data, it is be converted to a space in that field in the output file.

Grids and MicroGrids

The fundamental unit of measurement is the *grid cell*, measuring 1/25th of a degree of latitude by 1/25th of a degree of longitude, somewhat less than 15,000 feet on each side. The fundamental unit in building these grids is a *microgrid cell*, 1/8th of a grid cell on each side (therefore 1/200th of a degree on each side), 64 of these forming a full grid cell.

However, locations and clusterings of subscribers sometimes cause the reporting of information for an *effective grid cell* that is some part of a standard grid cell, or even parts of a standard grid cell augmented by a small part of another. Reporting is done per effective grid cell.

Base Grid File

Each of the 50 state files contains one record per *effective grid cell*. The records appear in the following order, from most major to most minor, all fields in ascending sequence:

Wire Center CLLI Code

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Central Latitude of Effective Grid Cell
Central Longitude of Effective Grid Cell

Each record of a state's Base Grid file contains the following fields, in the order presented here:

- **Wire Center CLLI**: The 8-character code identifying the wire center and its service area. This code, and other boundary and location information for each wire center, is taken from the BLR *Wire Center Premium Package* data files.

- **Central Latitude of Effective Grid Cell**: Latitude of the nominally central point of the effective grid cell, presented as degrees with 4 fractional digits.

- **Central Longitude of Effective Grid Cell**: Longitude of the nominally central point of the effective grid cell, presented as degrees with 4 fractional digits.

- **Area of the Effective Grid Cell**: The area, presented as square miles with up to 6 fractional digits.

- **Depth To Bedrock (Inches)**: Average minimum depth to bedrock for the effective grid cell, expressed in inches with up to 2 fractional digits. Currently, this is averaged for the underlying Census Block Group ... In the near future, it will be directly determined from underlying terrain data ... This distinction applies to the next five measures as well.

- **Rock Hardness**: Predominant rock hardness for the effective grid cell ... HARD or SOFT, or blank to indicate neither.

- **Surface Soil Texture**: Predominant surface soil texture in the effective grid cell, an abbreviation of up to 7 characters.

- **Water Table Depth (Feet)**: Average minimum water table depth for the effective grid cell, expressed in feet with up to 2 fractional digits.

- **Minimum Soil Slope**: Average minimum soil slope for the effective grid cell, expressed with 2 fractional digits.

- **Maximum Soil Slope**: Average maximum soil slope for the effective grid cell, expressed with 2 fractional digits

- **Number of Business Lines**: Count of Business Lines in the effective grid cell. Currently, this number is taken directly from the data of the BCPM model,

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apportioned from Census Block Group on a relative area basis ... We hope to improve the granularity of the source data.

- **Number of Households**: Count of Households in the effective grid cell. The source for this number is the Census Bureau's 1990 figures per Census Block; these numbers are then modified for each Census Block of a county by the Census Bureau's 1995 estimate of population change in that county. This number, for the effective grid cell, is apportioned from the numbers for Census Blocks overlapped by this effective grid cell on a relative area basis ... In the near future, for Census Blocks larger than 1 square mile, it will be on a relative road segment length basis.

- **Number of Housing Units**: Count of Housing Units in the effective grid cell. The source for this number is the Census Bureau's 1990 figures per Census Block; these numbers are then modified for each Census Block of a county by the Census Bureau's 1995 estimate of population change in that county. This number, for the effective grid cell, is apportioned from the numbers for Census Blocks overlapped by this effective grid cell on a relative area basis ... In the near future, for Census Blocks larger than 1 square mile, it will be on a relative road segment length basis.

The following ten fields are subdivision of the above Number of Housing Units, indicating the number of housing units in each of several structure sizes and types; with some tolerance for rounding, these 10 numbers – including their fractional digits – should sum to the Number of Housing Units above. The 10 fields are:

- **Number of Housing Units in Single-Unit Detached Structures**: Units in the traditional standalone house.
- **Number of Housing Units in Single-Unit Attached Structures**: Units that are, for example, garage apartments.
- **Number of Housing Units in Two-Unit Structures**: Units in a duplex.
- **Number of Housing Units in 3- to 4-Unit Structures**: Units in typical smallest apartment buildings or triplex or quadruplex.
- **Number of Housing Units in 5- to 9-Unit Structures**: Units in typical modest sized apartment buildings.
- **Number of Housing Units in 10- to 19-Unit Structures**: Units in larger apartment buildings.
- **Number of Housing Units in 20- to 49-Unit Structures**: Units in large apartment buildings.
- **Number of Housing Units in 50-or-Greater-Unit Structures**: Units in very large apartment buildings, typically high-rise.
- **Number of Housing Units that are Mobile Homes**: Mobile home units.
- **Number of Housing Units that are None of the Above**: For example, houseboats.

The record continues with the remaining fields:

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- **Latitude of Road Centroid**: For that center point of road segments of this effective grid cell, this is the latitude (the "Y" value).

- **Longitude of Road Centroid**: For each effective grid cell, a center point of road segments is calculated. This is the longitude (the "X" value) of that center point.

- **Distance from Switch**: Straight-line distance, in feet, of the road centroid of this effective grid cell from the switch that serves this effective grid cell.

- **FDI Code**: This 7-character code indicates the path and sequence of the feeder, subfeeder, and any part 2 subfeeder used to reach the road centroid of this effective grid cell. The characters of this code are in the form *qbdyyzz* where:

  - ***q*** indicates the quadrant: 1=East, 2=North, 3=West, 4=South
  - ***b*** indicates any main feeder splitting: 0=No split, 1=North/East leg, 2=South/West leg
  - ***d*** indicates direction of subfeeder from feeder: 1=East, 2=North, 3=West, 4=South
  - ***yy*** indicates a relative number (01..99) of this subfeeder, in this direction, off its main feeder
  - *zz* indicates a relative number (01..99) of this part 2 subfeeder, off this subfeeder ... If no part 2 subfeeder, this code is 00

- **Length Along Main Feeder**: Distance, in feet, along main feeder from switch to the point at which this effective grid cell's subfeeder comes off the main feeder.

- **Length Along Subfeeder**: Distance, in feet, along subfeeder from point at which this effective grid cell's subfeeder leaves main feeder to:

  - If a part 2 subfeeder is used, to the point at which the part 2 subfeeder departs from this subfeeder
  - If *no* part 2 subfeeder is used (e.g., inside 10,000 feet), to the road centroid of the effective grid cell itself

- **Length Along Part 2 Subfeeder**: If a part 2 subfeeder is used, distance in feet from point at which part 2 subfeeder departs subfeeder to the road centroid of this effective grid cell ... If no part 2 subfeeder is used, this number is 0.

Each effective grid cell is further partitioned into four *reporting quadrants*, <u>unless</u> the effective grid cell is only the size of a microgrid cell:

- Upper Left Quadrant (ULQ)

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- Upper Right Quadrant (URQ)
- Lower Left Quadrant (LLQ)
- Lower Right Quadrant (LRQ)

Each effective grid cell record includes information of all four of these quadrants, in the order specified above. For each of the quadrants, the following information appears, unless the effective grid cell is a *microgrid* cell (1/200th by 1/200th), in which case the full set of numbers is presented as the first (ULQ) quadrant's data, and the numbers for the remaining quadrants are all zero:

- **Quadrant Number of Housing Units**
- **Quadrant Number of Households**
- **Quadrant Number of Business Lines**
- **Quadrant Road Segment Length**
- **Quadrant Road Reduced Area**
- **Quadrant Road Centroid Horizontal (X) Distance**: From grid cell road centroid, in feet
- **Quadrant Road Centroid Vertical (Y) Distance**: From grid cell road centroid, in feet

Wire Center Terrain File

There is one record per wire center, in ascending order by wire center 8-character CLLI code. The data fields are these:

- **Wire Center CLLI**: The 8-character code identifying the wire center and its service area.

- **Area of the Service Area**: The area, in square miles with fractional digits, of the wire center service area.

- **Depth To Bedrock (Inches)**: Minimum depth to bedrock for the wire center service area, expressed in inches with up to 2 fractional digits.

- **Fraction of Area with HARD Rock**: Decimal fraction indicating portion of wire center service area for which rock hardness is HARD.

- **Fraction of Area with Normal Rock**: Decimal fraction indicating portion of wire center service area for which rock hardness is normal.

- **Fraction of Area with SOFT Rock**: Decimal fraction indicating portion of wire center service area for which rock hardness is SOFT.

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- **Surface Soil Texture**: Predominant surface soil texture in the wire center service area, an abbreviation of up to 7 characters.

- **Water Table Depth (Feet)**: Minimum water table depth for the wire center service area, expressed in feet with up to 2 fractional digits.

- **Minimum Soil Slope**: Minimum soil slope for the wire center service area, expressed as degrees with 2 fractional digits.

- **Maximum Soil Slope**: Maximum soil slope for the wire center service area, expressed as degrees with 2 fractional digits.

Wire Center Information File

There is one record per wire center, in ascending order by wire center 8-character CLLI code. The data fields are these:

- **Wire Center CLLI**: The 8-character code identifying the wire center and its service area.

- **Operating Company Name**: Name of the operating company

- **Central Office Type**: Type of the central office (H=Host, R=Remote)

CBG-to-Grid Equivalence File

There is one record per combination of Census Block Group and effective grid cell that overlays any part of it. These records are in the following order, major to minor, all ascending:

FIPS Code of Census Block Group
    Latitude of Nominal Centerpoint of Effective Grid Cell
    Longitude of Nominal Centerpoint of Effective Grid Cell

Each record contains the following data fields:

- **Census Block Group FIPS Code**: Standard code identifying a CBG.

- **Wire Center CLLI Code**: 8 -character CLLI code identifying the wire center to which this record belongs.

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- **Central Latitude of Effective Grid Cell**: Latitude of the nominally central point of the effective grid cell, presented as degrees with 4 fractional digits.

- **Central Longitude of Effective Grid Cell**: Longitude of the nominally central point of the effective grid cell, presented as degrees with 4 fractional digits.

- **Fraction of CBG's Households in this Effective Grid Cell**: Decimal fraction, indicating portion of the Households of the CBG that are allocated to this effective grid cell.

- **Fraction of CBG's Housing Units in this Effective Grid Cell**: Decimal fraction, indicating portion of the Housing Units of the CBG that are allocated to this effective grid cell.

- **Fraction of CBG's Business Lines in this Effective Grid Cell**: Decimal fraction, indicating portion of the Business Lines of the CBG that are allocated to this effective grid cell.

Telephone Companies' File

This file is a single file for the entire country. It is in order by Operating Company Name, ascending. The data fields are:

- **Operating Company Name**: Name as it appears in Wire Center Information file.

- **Parent Company Name**: Name of its parent company.

- **Company Size**: (S=Small, M=Medium, L=Large)

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ATTACHMENT 3

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Workbook: G:\bcpm2\modules\loop\BCPM_Loop.xls
File date: 9/29/97 3:01:38 PM
Comments:

Worksheets:
Grid Data
Output
Grid Demographics
Switching
Main Feeder
SubFeeder
Main&SubfeederAllocation
Subfeeder Part2
New Distribution
Investment
Term,Drop,&NID
Electronics&FDI
DLC to FDI
Structure Inputs
Cable Cost Inputs
Terminal-SAI Inputs
Drop&NID Inputs
DLC&Elec Inputs
Percent Table Inputs
Misc Table Inputs
Misc Inputs
Structure Tables
Cable Tables
Other Cost Tables
Fixed Tables
FCC Data

Sheet: Grid Data

Col	Range Name	Column Name	Column Comment	Formula
A	CLLI*	Clli		
B	Latitude	Latitude		
C	Longitude	Longitude		
D	Area_sq_Miles	Area-sq Miles		
E	DepthtoBedrock	Depth to Bedrock (Inches)		
F	RockHardness	Rock Hardness		

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G	SurfaceSoilTexture	Surface Soil Texture		
H	WaterTableDepth	Water Table Depth (Feet)		
I	MinimumSoilSlope	Minimum Soil Slope		
J	MaximumSoilSlope	Maximum Soil Slope		
K	TotalBusinessLines	Total Business Lines		
L	BusinessLocations	Business Locations		
M	TotalHouseholds	Total Households		
N	HousingUnits	Housing Units		
O	SingleUnitDetachedHUlocations	Single Unit Detached HU Locations		
P	SingleUnitAttachedHUlocations	Single Unit Attached HU Locations		
Q	_2HUPerDwellinglocations	2 HU Per Dwelling Locations		
R	_3to4HUperdwellinglocations	3-4 HU Per Dwelling Locations		
S	_5to9HUperdwellinglocations	5-9 HU Per Dwelling Locations		
T	_10to25HUperdwellinglocations	10-19 HU Per Dwelling Locations		
U	_25to50HUperdwellinglocations	20-49 HU Per Dwelling Locations		
V	Over50HUperdwellinglocations	>50 HU Per Dwelling Locations		
W	MobileHUlocations	Mobile HU Locations		
X	OtherHUlocations	Other HU Locations		

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Y	LatitudeAtRoadCentroid	Latitude At Road Centroid		
Z	LongitudeAtRoadCrossing	Longitude At Road Centroid		
AA	AirlineDistance	Airline Distance Feet		
AB	FDICode*	FDI Code		
AC	MainFeederLength	Main Feeder Length		
AD	SubfeederLength	Sub Feeder Length		
AE	Part2SubfeederLength	Part 2 SubFeeder Length		
AF	ULQHousingUnits	ULQ Housing Units		
AG	ULQHouseholds	ULQ Households		
AH	ULQBusinessLines	ULQ Business Lines		
AI	ULQRoadLength	ULQ Road Length		
AJ	ULQArea	ULQ Road Reduced Area		
AK	ULQHorizontalfttoRoadCentroid	ULQ Horizontal Feet To Road Centroid		
AL	ULQverticalfttoRoadCentroid	ULQ Vertical Feet To Road Centroid		
AM	URQHousingUnits	URQ Housing Units		
AN	URQHouseholds	URQ Households		
AO	URQBusinessLines	URQ Business Lines		
AP	URQRoadLength	URQ Road Length		
AQ	URQArea	URQ Road Reduced Area		
AR	URQHorizontalfttoRoadCentroid	URQ Horizontal Feet To Road Centroid		
AS	URQverticalfttoRoadCentroid	URQ Vertical Feet To Road Centroid		
AT	LLQHousingUnits	LLQ Housing Units		
AU	LLQHouseholds	LLQ Households		
AV	LLQBusinessLines	LLQ Business Lines		

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