

IMPAIRMENT DATA DOWNLOADS

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1. Overview of License Impairment Data

This document provides the data file specifications for the impairment data files that will be made available for download to forward auction bidders. Each file specification includes the format of the file and definitions of the data elements in the files including a name, description, data type, and notes or examples. At the end of each file specification sample data for the file is provided. Data type definitions and notation rules are explained in an appendix attached to this document.

The impairment data will be broken into three zip files. The first zip file will provide license-level impairment information and maps. The second zip file contains the detailed impairment information at a 2x2 km grid cell level for all four ISIX cases.¹ In addition, the second zip will contain all the eNB dummy points which are predicted to cause interference to at least one 2x2 km grid cell inside a facility's protected contour.² The third zip file contains several reference files which, unlike the data in the first two zip files, do not contain data that change with the clearing target.

2. License Impairment Data (Zip File)

File name: license_impairment_data-stage#.zip

The first zip file will provide license-level impairment information and maps. This zip file will be generated for every stage and includes the following files:

1. Information on TV stations assigned to channels in the 600 MHz wireless band
2. License Impairment by Uplink-Downlink (Aggregated impairments for all PEAs given the current set of station to channel assignments)
3. ISIX Tableau Report (Tableau file showing impairment levels)

2.1. Stations in Market Variation

File name: market_variation_station_list.csv

The file contains information about which facilities (including both US and international TV stations) have been assigned to a channel in the 600 MHz Band.³

File Requirements:

- CSV file (first row contains header).
- One record per facility.

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002

¹ See Appendix for a short description of the four ISIX Cases.

² This data is produced when the ISIX data is created but is not used in the license impairment calculations. Forward auction bidders may nonetheless find this data useful as it provides bidders additional information about the extent of Case 3 impairments to each county caused by a specific eNB dummy point at a certain level of overlap.

³ Stations in the 600 MHz Band may be assigned to the uplink, downlink or duplex gap.

StageID	Stage Number	Integer {1,3}	1
FacilityID	Identifies a station placed in the 600 MHz Band	Integer	5802
ChannelID	Identifies the channel assigned to a station in the 600 MHz Band	Integer	48

2.2. License Impairment by Uplink-Downlink

File name: license_impairment_by_uplink-downlink-stage#.csv

This file contains information about which category (e.g., Category 1, Category 2 and Not For Sale) each license is mapped to based on the overall impairment level for the license (combining impairments from both the uplink and downlink portions of the block). This file also contains a breakdown by uplink and downlink of the percent of population with predicted impairment in each license for the current clearing target and assignment of stations to channels in the 600 MHz Band. This information can be found in the “DownlinkPercentImpaired” and “UplinkPercentImpaired” fields in the table below.

File Requirements:

- CSV file (first row contains header).
- One record per PEA and block.

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
StageID	Stage Number	Integer {1,3}	1
MarketNumber	The PEA (Partial Economic Area) ID	String (["PEA"][0-9][0-9][0-9]){6}	PEA004 PEA205
BlockID	The Block ID of the 10-MHz portion of wireless spectrum (or 5-MHz portion if looking at just the uplink and downlink)	Character [A-L]{1}	F

Field	Description	Data Type	Example/Notes
CategoryCode	Indicates the generic license category "C1" = License Category 1 "C2" = License Category 2 "NS" = Not for Sale	Character [C1 C2 NS] {2}	C1
PercentImpaired	Percent of Population Impaired The percent of population associated with the market-block (i.e., license) predicted to be impaired.	Numeric [0.0-100.0]{3,5}	11.2
DownlinkPercentImpaired	The percent of the PEA population with impairments in the downlink portion of the license predicted to be impaired.	Numeric	7.3
UplinkPercentImpaired	The percent of the PEA population with impairments in the uplink portion of the license predicted to be impaired.	Numeric	3.9

Sample Data:

AuctionID,StageID,MarketNumber,BlockID,CategoryCode,PercentImpaired,DownlinkPercentImpaired,UplinkPercentImpaired

1000,1,PEA142,A,NS,64.3,44.2,54.9

1000,1,PEA142,B,NS,65.0,30.3,54.9

1000,1,PEA142,C,C2,23.3,0.6,23.2

1000,1,PEA142,D,C2,40.1,35.5,24.2

1000,1,PEA142,E,C2, 29.9,26.7,17.0

1000,1,PEA142,F,C1,13.0,0.0,13.0

1000,1,PEA142,G,C1,0.0,0.0,0.0

1000,1,PEA142,H,C1,0.0,0.0,0.0

1000,1,PEA142,I,C1,0.0,0.0,0.0

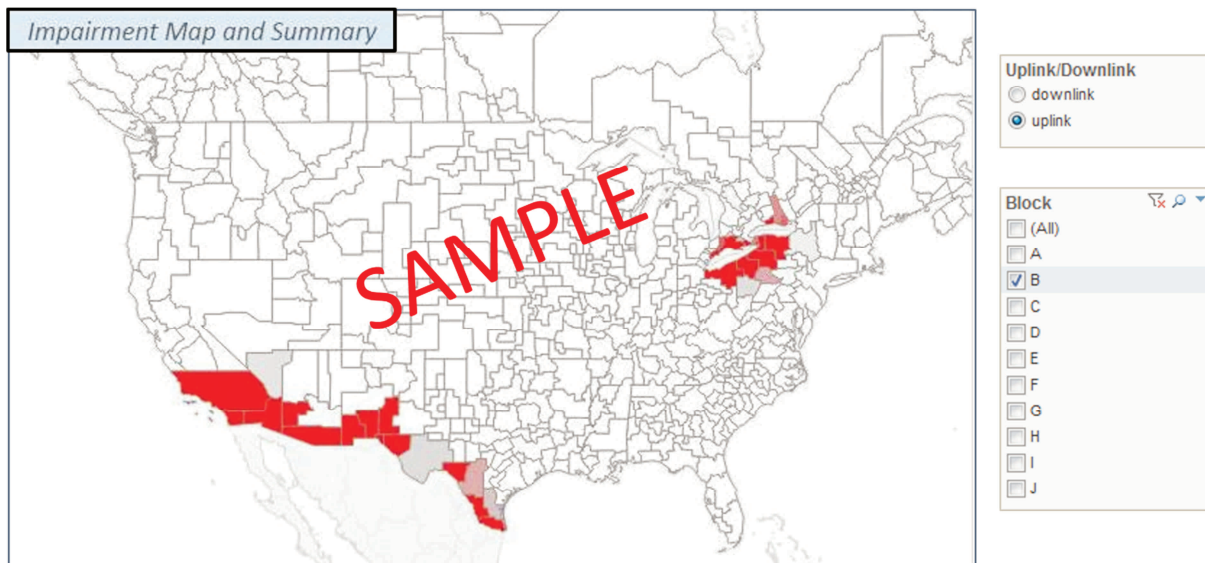
1000,1,PEA142,J,C1,0.0,0.0,0.0

2.3. ISIX Tableau Report

File name: ISIX_Tableau_Report.twbx

Tableau file will show impairment data in a map that can be viewed using a Tableau Reader (free to download on the Tableau website). The Tableau file will be set up as a dashboard including impairment maps with filters where bidders will be able to choose between blocks, uplink/downlink and zoom into any particular PEA that they are interested in.

Below is an example of what one of the Tableau maps may look like using sample impairment data.



3. ISIX Case Impairment Data (Zip File)

File name: ISIX_case_impairment_data-stage#.zip

The second zip file of impairment data contains the detailed impairment information at a 2x2 km grid cell level for all four ISIX cases. In addition, the second zip will contain a file that identifies all the eNB dummy points which are predicted to cause interference to at least one 2x2 km grid cell inside a facility's protected contour.

This zip file will be generated for every stage and includes the following information:

1. Case 1 Impaired Points: All 2x2 km grid cells ("points") in the US and Canada which exceed the ISIX impairment Case 1 threshold or fall inside a facility's protected contour.
2. Case 2 Impaired Points: All 2x2 km grid cells ("points") in the US and Canada which exceed the ISIX impairment Case 2 threshold or fall inside a facility's protected contour.

3. Case 3 Impaired Points: All 2x2 km grid cells (“points”) in the US that fall in areas (counties) where an eNB dummy point is predicted to cause interference within a facility’s protected contour or that fall in areas (counties) which are inside or within 5 km of a facility’s protected contour.
4. Case 4 Impaired Points: All 2x2 km grid cells (“points”) in the US that fall inside a facility’s protected contour or that are within 5 km (co-channel) or 0.5 km (adjacent channel) of a facility’s protected contour.
5. eNB Points: All eNB dummy points which are predicted to cause interference inside a facility’s protected contour.

3.1. Case 1 Impaired Points File (2x2)

File name: case1_ISIX.csv

This file contains all Case 1 impaired points (in the US and Canada) for the current clearing target and assignment of stations to channels in the 600 MHz Band.

File Requirements:

- CSV file (first row contains header).
- One record for every point key – block – facility – channel combination where Ix =1 and/or InCon =1.

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
StageID	Stage Number	Integer {1,3}	1
PointKey	The unique identifier of the 2x2 km point	Long Integer	103245078
BlockID	The Block ID of the 5MHz portion of wireless spectrum	Character [A-L]{1}	F
FacilityID	Identifies the station causing the interference to the wireless base station receiver.	Integer	5802
ChannelID	Identifies the channel assigned to the interfering station.	Integer	48
Margin	The difference between the interference threshold and the interfering field strength. The more negative this number is, the greater the predicted interfering field strength.	Numeric	-9.7412867

Field	Description	Data Type	Example/Notes
Ix	Indicates if interference is predicted: 0= interference is not predicted 1= interference is predicted If Ix=0, then InCon will always equal 1. If Ix=1 then InCon can be either 0 or 1.	Integer [0 1]	0
InCon	Indicates if the point is inside or outside the TV station's protected contour: 0= the point is outside of the TV station's protected contour 1= the point is inside of the TV station's protected contour If InCon=0, then Ix will always equal 1. If InCon = 1, then Ix can be either 0 or 1.	Integer [0 1]	1

Sample Data:

AuctionID,StageID,PointKey,BlockID,FacilityID,ChannelID,Margin,Ix,InCon

1000,1,48054992,A, 189357,44,-0.234392,1,0
1000,1,48054992,B, 189357,44,-0.234392,1,0
1000,1,48055106,C, 189357,45,-1.720639,1,0
1000,1,48084848,A, 189357,44,-1.325575,1,0
1000,1,48084848,B, 189357,44,-1.325575,1,0
1000,1,48084851,A, 189357,44,-1.290575,1,0
1000,1,48084851,B, 189357,44,-1.290575,1,0
1000,1,48084854,A, 189357,44,-1.24229,1,0
1000,1,48084854,B, 189357,44,-1.24229,1,0
1000,1,48084860,A, 189357,44,-1.193686,1,0
1000,1,48084860,B, 189357,44,-1.193686,1,0

3.2. Case 2 Impaired Points File (2x2)

File name: case2_ISIX.csv

This file contains all Case 2 impaired points (in the US and Canada) for the current clearing target and assignment of stations to channels in the 600 MHz Band.

File Requirements:

- CSV file (first row contains header).

- One record for every point key – block – facility – channel combination where Ix =1 and/or InCon =1.

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
StageID	Stage Number	Integer {1,3}	1
PointKey	The unique identifier of the 2x2 km point	Long Integer	103245078
BlockID	The Block ID of the 5MHz portion of wireless spectrum	Character [A-L]{1}	F
FacilityID	Identifies the station causing the interference to the wireless base station.	Integer	5802
ChannelID	Identifies the channel assigned to the interfering station.	Integer	43
Margin	The difference between the interference threshold and the interfering field strength. The more negative this number is, the greater the predicted interfering field strength.	Numeric	-9.7412867
Ix	Indicates if interference is predicted: 0= interference is not predicted 1= interference is predicted If Ix=0, then InCon will always equal 1. If Ix=1 then InCon can be either 0 or 1.	Integer [0 1]	0
InCon	Indicates if the point is inside or outside the TV station's protected contour: 0= the point is outside of the TV station's protected contour 1= the point is inside of the TV station's protected contour If InCon=0, then Ix will always equal 1. If InCon = 1, then Ix can be either 0 or 1.	Integer [0 1]	1

Sample Data:

AuctionID,StageID,PointKey,BlockID,FacilityID,ChannelID,Margin,Ix,InCon
1000,1,51225377,A,6124,31,-1.281361,1,0
1000,1,51225380,A,6124,31,-1.050331,1,0
1000,1,51225386,A,6124,31,-1.861965,1,0
1000,1,51225389,A,6124,31,-1.545013,1,0
1000,1,51225392,A,6124,31,-1.521709,1,0
1000,1,51225395,A,6124,31,-1.433567,1,0
1000,1,51225398,A,6124,31,-1.397308,1,0
1000,1,51225401,A,6124,31,-1.230541,1,0
1000,1,51225407,A,6124,31,-1.156147,1,0

3.3. Case 3 Impaired Points File (2x2)

File name: case3_ISIX.csv

This file contains all Case 3 impaired points (in the US only) for the current clearing target and assignment of stations to channels in the 600 MHz Band. International TV stations with channel assignments that fall within the 600 MHz wireless band plan based on the current clearing target are included in the protected station list. However, international protected contours are truncated at the US border when considering areas where interference could occur.

File Requirements:

- CSV file (first row contains header).
- One record for every point key – block – facility – channel combination.
- There are records for all impaired points where county ix =1 and/or incon2= 1

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
StageID	Stage Number	Integer {1,3}	1
PointKey	The unique identifier of the 2x2 km point in the impairing county	Long Integer	103245078

Field	Description	Data Type	Example/Notes
BlockID	The Block ID of the 5MHz portion of wireless spectrum	Character [A-L]{1}	F
FacilityID	Identifies the station causing the interference to the wireless base station.	Integer	5802
ChannelID	Identifies the channel assigned to the interfering station.	Integer	43
Ix	Indicates if interference is predicted: 0= interference is not predicted 1= interference is predicted If Ix=0, then InCon2 must equal 1.	Integer [0 1]	1
InCon2	Indicates if county touches or comes within 5 km of protected TV contour: 0= the county does not come within 5 km of the protected contour boundary 1= the county comes within 5 km of the protected contour boundary If InCon2=0, then Ix must equal 1.	Integer [0 1]	1

Sample Data:

AuctionID,StageID,PointKey,BlockID,FacilityID,ChannelID,Ix,InCon2

1000,1,46289744,H,7020138,38,1,1

1000,1,46289747,A,6124,31,1,0

1000,1,46289747,A,7020132,32,1,1

1000,1,46289747,A,7020133,33,1,1

1000,1,46289747,B,7020132,32,1,1

1000,1,46289747,B,7020133,33,1,1

1000,1,46289747,B,7020134,34,1,1

3.4. Case 4 Impaired Points File (2x2)

File name: case4_ISIX.csv

This file contains all Case 4 impaired points (in the US only) for the current clearing target and assignment of stations to channels in the 600 MHz Band. International TV stations with channel assignments that fall within the US 600 MHz wireless band plan based on the current clearing target are included in the protected station list. However, international protected contours are truncated at the US border when considering areas where interference could occur.

File Requirements:

- CSV file (first row contains header).
- One record for every point key – block – facility – channel combination where ix =1

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
StageID	Stage Number	Integer {1,3}	1
PointKey	The unique identifier of the 2x2 km point	Long Integer	103245078
BlockID	The Block ID of the 5MHz portion of wireless spectrum	Character [A-L]{1}	F
FacilityID	Identifies the station causing the interference to the wireless base station.	Integer	5802
ChannelID	Identifies the channel assigned to the interfering station.	Integer	43

Field	Description	Data Type	Example/Notes
Ix	Indicates if interference is predicted: 1= interference is predicted based on point falling inside the protected contour or within either 5 km of protected contour (co-channel) or within 0.5 km of protected contour (adjacent-channel)	Integer [1]	1
InCon2	Indicates if the point is inside the facility's protected contour: 0= the point is outside the protected contour 1= the point falls inside the protected contour	Integer [0 1]	1

Sample Data:

AuctionID,StageID,PointKey,BlockID,FacilityID,ChannelID,Ix,InCon2

1000,1,51464576,B,7020344,44,1,0

1000,1,51464579,A,7020344,44,1,0

1000,1,51464579,B,7020344,44,1,0

1000,1,51464582,A,7020344,44,1,0

1000,1,51464582,B,7020344,44,1,0

1000,1,51464585,A,7020344,44,1,0

1000,1,51464585,B,7020344,44,1,0

3.5. eNB Points (10x10)

File name: eNB_points.csv

This file contains all the eNB dummy points which are predicted to cause interference inside a facility's protected contour. Interference from an eNB dummy point serves as a proxy for the 10x10 km grid area surrounding the dummy point and therefore a single eNB point may be mapped to multiple county areas.

File Requirements:

- CSV file (first row contains header).
- One record for every facility – point – county combination.

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
OL	Overlap value. Value from +5 to -5	Integer	-5
FacilityID	Identifies the station being interfered by the eNB dummy point.	Integer	5802
PointID	Unique identifier of the eNB point.	Integer	5802
CountyFips	The County FIPS code of a county that touches or intersects with a 10 x 10 kilometer bounding box with the eNB point at its center.	Character [0-9]{5}	01001
LeastIX	Maximum($IXvalue = InterferenceThreshold - Interference$). Where InterferenceThreshold is a function of the spectral overlap (OL)	Numeric	
MostIX	Minimum($IXvalue$)	Numeric	
Hist1	Count of number of 2x2 km grid points inside protected contour where $IXvalue < -30$ dB	Integer	
Hist2	Count of number of 2x2 km grid points inside protected contour where $-30 \leq IXvalue < -27$ dB	Integer	
Hist3	Count of number of 2x2 km grid points inside protected contour where $-27 \leq IXvalue < -24$ dB	Integer	
Hist4	Count of number of 2x2 km grid points inside protected contour where $-24 \leq IXvalue < -21$ dB	Integer	
Hist5	Count of number of 2x2 km grid points inside protected contour where $-21 < IXvalue \leq -18$ dB	Integer	
Hist6	Count of number of 2x2 km grid points inside protected contour where $-18 < IXvalue \leq -15$ dB	Integer	
Hist7	Count of number of 2x2 km grid points inside protected contour where $-15 < IXvalue \leq -12$ dB	Integer	
Hist8	Count of number of 2x2 km grid points inside protected contour where $-12 < IXvalue \leq -9$ dB	Integer	

Field	Description	Data Type	Example/Notes
Hist9	Count of number of 2x2 km grid points inside protected contour where $-9 < IXvalue \leq -6$ dB	Integer	
Hist10	Count of number of 2x2 km grid points inside protected contour where $-6 < IXvalue \leq -3$ dB	Integer	
Hist11	Count of number of 2x2 km grid points inside protected contour where $-3 < IXvalue < 0$ dB	Integer	

Sample Data:

AuctionID,OL,FacilityID,PointID,CountyFips,LeastIX,MostIX,Hist1,Hist2,Hist3,Hist4,Hist5,Hist6,Hist7,Hist8,Hist9,Hist10,Hist11

1000,5,35608,56665,06027,-9.688053,-9.688053,0,0,0,0,0,0,0,1,0,0,0
1000,5,35608,53331,06027,-23.743518,-23.743518,0,0,0,1,0,0,0,0,0,0,0
1000,5,35608,56665,06027,-24.371799,-24.371799,0,0,1,0,0,0,0,0,0,0
1000,5,35608,56667,06027,-24.724719,-24.724719,0,0,1,0,0,0,0,0,0,0
1000,5,35608,56711,06027,-1.358432,-1.358432,0,0,0,0,0,0,0,0,0,1
1000,5,35608,56733,06027,-23.934985,-23.934985,0,0,0,1,0,0,0,0,0,0
1000,5,22161,56667,06027,-17.909518,-17.909518,0,0,0,0,1,0,0,0,0,0
1000,5,22161,52328,06073,-0.0006771,-23.91227,0,0,0,11,3,19,9,14,14,20,28

4. Reference Files (Zip File)

File name: reference_files.zip

This zip file includes the following files which do not change regardless of clearing target but will still be generated for every stage:

1. ISIX Points Reference: All 2x2 grid points referenced in the Case 1 through Case 4 reports
2. eNB Points Reference: All eNB dummy points
3. Overlap Matrix: Contains information on the ISIX spectral overlaps between wireless and TV channels for all of the band plans under consideration.

4.1. ISIX Points Reference

File name: ISIX_points_reference.csv

This file contains all 2x2 km grid points referenced in the Case 1 through Case 4 reports.

File Requirements:

- CSV file (first row contains header).

- One record for every point key.
- There are records for all points including points with 0 (Zero) population

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
PointKey	The unique identifier of the 2x2 km point	Long Integer	103245078
Latitude	The latitude of the 2x2 km point population centroid	Numeric	30.997389880000
Longitude	The longitude of the 2x2 km point population centroid	Numeric	-86.075708100000
PointPopulationCount	The population count of the 2x2 km point	Integer	7560
CountyFips	The County FIPS code to which this 2x2 km point belongs.	Character [0-9]{5}	01001 48041 4T007
MarketNumber	The PEA (Partial Economic Area) ID or Canadian market ID	String (["PEA"][0-9] [0-9][0-9]){6} Or (["CAN"][0-9] [0-9][0-9]){6}	PEA004 CAN065
Country	The country to which this 2x2 km point belongs.	String [US CA] {2}	US CA

Sample Data:

AuctionID,PointKey,Latitude,Longitude,PointPopulationCount,CountyFips,MarketNumber,Country
1000,64326954,38.8285,-123.128,0,06097,PEA004,US
1000,64356741,38.8465,-122.39,0,06055,PEA004,US
1000,64356816,38.8465,-122.828,0,06097,PEA004,US
1000,64356819,38.8465,-122.852,0,06097,PEA004,US
1000,64356822,38.8465,-122.875,0,06097,PEA004,US
1000,64356828,38.8385,-122.903,2,06097,PEA004,US

1000,77896270,47.0257,-63.9853,0,4T007,CAN007,CA
 1000,77896273,47.0257,-64.0114,0,4T007,CAN007,CA
 1000,77896276,47.0257,-64.0375,0,4T007,CAN007,CA
 1000,77896282,47.0257,-64.0636,0,4T007,CAN007,CA
 1000,77926174,47.0438,-63.9592,0,4T007,CAN007,CA
 1000,77926180,47.0438,-63.9853,0,4T007,CAN007,CA
 1000,77926183,47.0438,-64.0114,0,4T007,CAN007,CA

4.2. eNB Points Reference

File name: eNB_points_reference.csv

This file contains all the eNB dummy points referenced in eNB Points report.

File Requirements:

- CSV file (first row contains header).
- One record for every point – county combination.

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002
PointID	Unique identifier of the eNB transmit point.	Integer	
GrdLon_NAD83	The longitude of the eNB point in NAD 83.	Numeric	30.997389880000
GrdLat_NAD83	The latitude of the eNB point in NAD83	Numeric	86.075708100000
CountyFips	The County FIPS code of a county that touches or intersects with a 10 x 10 kilometer bounding box with the eNB point at its center.	Character [0-9]{5}	01001
CountyName	Name of the county	String {1,100}	Jefferson
MarketNumber	The PEA (Partial Economic Area) ID	String (["PEA"][0-9] [0-9][0-9]){6}	PEA004 PEA205

Field	Description	Data Type	Example/Notes
EAMarketNumber	Economic Area in which eNB point falls	Character {5}	“EA” + 3 digit EA number

Sample Data:

AuctionID,PointID,GrdLon_NAD83,GrdLat_NAD83,CountyFips,CountyName,MarketNumber, EAMarketNumber

1000,2750,-94.4446,29.9925,48291,Liberty,PEA010,EA131

1000,2750,-94.4446,29.9925,48245,Jefferson, PEA135,EA087

1000,2751,-94.4446,29.9026,48291,Liberty, PEA010,EA131

1000,2751,-94.4446,29.9026,48071,Chambers, PEA010,EA131

1000,2751,-94.4446,29.9026,48245,Jefferson, PEA135, EA087

1000,2752,-94.4446,29.8127,48071,Chambers, PEA010,EA131

1000,2753,-94.4446,29.7227,48071,Chambers, PEA010,EA131

4.3. Overlap (OL) Matrix File

File name: OL_matrix.csv

This file contains information on the amount of spectral overlap, in MHz, between the interfering transmitter channel and the interfered-with receiver channel.

File Requirements:

- CSV file (first row contains header).
- One record for every clearing target – and 5 MHz block combination

Field	Description	Data Type	Example/Notes
AuctionID	The FCC auction number for the forward auction	Integer {1,6}	1002

Field	Description	Data Type	Example/Notes
ClearingTarget	Integer number of MHz reclaimed from TV corresponding to the national band plan clearing target (CT).	Integer	84
UL_DL	<p>“U” when TV channel is co- or adjacent-channel with spectrum used for communication between mobile device and base station receiver.</p> <p>“D” when TV channel is co- or adjacent-channel with spectrum used for base station transmitter to mobile device receiver.</p>	Character [U D]{1}	U
BlockID	Character representing a 5 MHz wireless channel block (A through L, depending on CT).	Character [A-L]{1}	G
First Row: <DTV Channel Number> from 51 to 27 separated by commas	Integer value corresponding to 6 MHz TV channels. A clearing target of 144 MHz goes to channel 27, so no lower channel numbers are needed.	Integer [27-51]	36
Subsequent rows: <matrix values>	Integer represents the amount of spectral offset (negative values) or overlap (positive values) in MHz units. NULL value when spectral overlap is not considered significant.	Integer [-5-+5]{0,2}	-5

Sample Data:

AuctionID,ClearingTarget,UL_DL,Blk,51,50,49,48,47,46,45,44,43,42,41,40,39,38,37,36,35,34,33,32,31,30,29,28,27

1000,42,U,B,5,-1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

1000,42,U,A,1,4,-2,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

1000,42,D,B,,,-3,3,2,-4,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

1000,42,D,A,,,-2,4,1,-5,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

1000,48,U,C,5,-1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

1000,48,U,B,1,4,-2,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

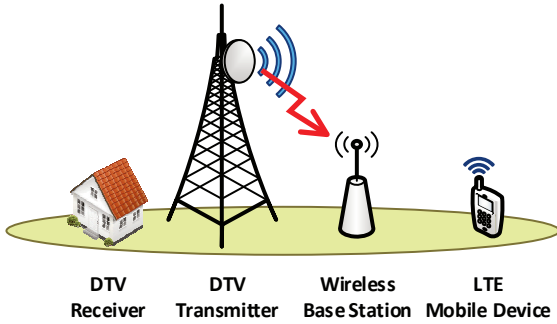
1000,48,U,A,-4,2,3,-3,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

5. Appendix: ISIX Case Descriptions:

Interference to Wireless (ISIX Cases 1 & 2):

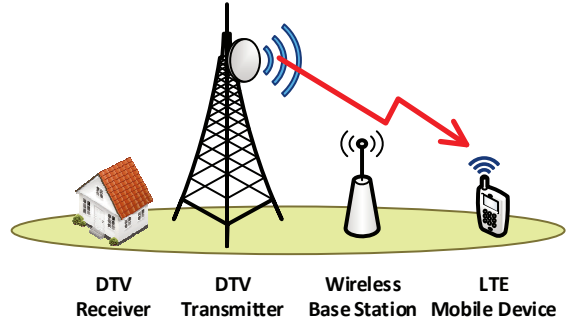
Case 1

Interference to: **Wireless Base Station Receiver**
Caused by: **DTV Transmitter**



Case 2

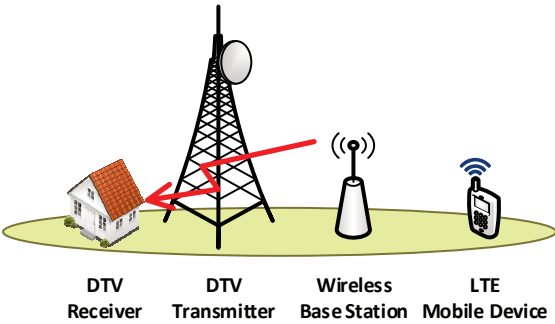
Interference to: **Mobile Device Receiver**
Caused by: **DTV Transmitter**



Interference to TV (ISIX Cases 3 & 4):

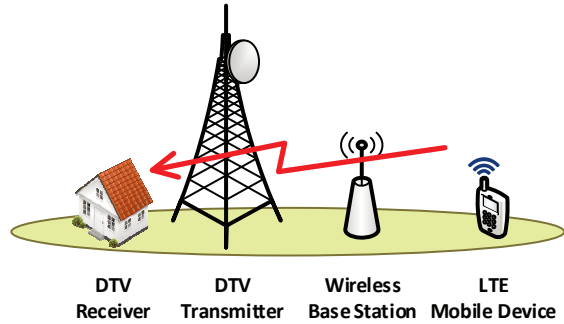
Case 3

Interference to: **DTV Receiver**
Caused by: **Wireless Base Station Transmitter**



Case 4

Interference to: **DTV Receiver**
Caused by: **Mobile Device Transmitter**



6. Appendix: Data Type Definitions:

The following is a guide to interpreting data types defined in this document. This guide is based on regular expressions used in XML standards.

Valid Data Types used in this Document

Character: A character is a single standard ASCII character. The following list has examples of valid ASCII characters:

- a
- D
- 3
- %

String: A string contains one or more characters and can contain whitespace. The following list has examples of valid strings:

- PEA001
- 005
- 588.3-593.3 MHz + 628.3-633.3 MHz
- Huntsville-Decatur-Florence, AL

Numeric: Numeric is a generic data type that covers a number of different underlying data types. As a result, anything defined as numeric could be any of the following:

- Decimal
- Integer
- Long

Integer: The integer data type is used to specify a numeric value without a fractional component.

- It's assumed that any Integers defined in this document are unsigned and never include a (+) plus or (-) minus sign. Any signed Integers containing a + or - are considered invalid.
- If the Integer is of defined length then curly brackets should be used. E.g., {3} indicates the integer should be exactly 3 numbers long.
- The maximum value of an unsigned Integer is $2^{32}-1$ which is 4294967295

The following list has examples of valid Integers:

- 009
- 9
- 2147483647

The following list has examples of *invalid* Integers:

- -009
- +009
- 2147483648 (i.e. too large)

Restricting values for a data type

Restrictions are used to define acceptable values for any given data type. The following lexicon is used when defining data types:

- Square brackets define the *pattern*.
 - e.g., [A-L] means only the uppercase letters A through L are allowed.
 - e.g., [U|D] means only the uppercase letters U or D are allowed.
 - e.g., [0-9] means only the numbers 0 through 9 are allowed
- Curly brackets define the *length* including whitespace.
 - e.g., {3} means the value has to be exactly 3 characters long.
 - e.g., {1,3} means the value has to be a minimum of 1 character and a maximum of 3 characters.
 - e.g., {0,50} means the value has to be a minimum of 0 characters and a maximum of 50 characters.

Example 1:

The Data Type is defined as follows:

Integer
{3}

The curly brackets mean only a 3 digit integer is allowed.

Valid Values for example 1:

- 009
- 056
- 102

Invalid Values for example 1:

- 09
- 3502
- 1
- +12
- -35

Example 2:

The Data Type is defined as follows:

String
[A-L]{1}

The square brackets mean only the uppercase letters A through L are allowed and the curly brackets mean it must be exactly 1 character long.

Valid Values for example 2:

- B
- L

Invalid Values for example 2:

- a
- M
- 6

Example 3:

The Data Type is defined as follows:

String
[0-9]{3}

The square brackets mean only the numbers 0 through 9 are allowed and the curly brackets mean it must be 3 characters long.

Valid Values for example 3:

- 001
- 023
- 358

Invalid Values for example 3:

- 2
- 01
- 2026

Example 4:

The Data Type is defined as follows:

String
[0-9]{1,2}

The square brackets mean only the numbers 0 through 9 are allowed and the curly brackets mean it must be a minimum of 1 character long and a maximum of 2 characters long.

Valid Values for example 4:

- 4
- 04
- 41

Invalid Values for example 4:

- 123
- Blank or null value

Example 5:

The Data Type is defined as follows:

String
[US|CA|MX]{2}

The square brackets mean the pattern must be either US, CA or MX. The curly brackets mean it must be exactly 2 characters long.

Valid Values for example 5:

- US
- CA

Invalid Values for example 5:

- C
- USA

Example 6:

The Data Type is defined as follows:

String
 ([“PEA”][0-9] [0-9] [0-9]){6}

The square brackets inside the round brackets mean the pattern must be a concatenation of the text “PEA” followed by three single numbers, with each number ranging from 0 through 9. The curly brackets mean it must be exactly 6 characters long.

Valid Values for example 6:

- PEA002
- PEA356

Invalid Values for example 6:

- PEA0001
- PEA-005
- PEA-05
- PEA-0512
- PEA-2

Example 7:

The Data Type is defined as follows:

String
 {0,50}

The absence of square brackets mean there are no restrictions to the characters in this string. The curly brackets mean it must be a minimum of 0 characters long (i.e., can be blank/null) and a maximum of 50 characters long.

Valid Values for example 7:

- 588.3-593.3 MHz + 628.3-633.3 MHz
- Albuquerque-Santa Fe, NM

Invalid Values for example 7:

- Greenville-Spartanburg, SC-Asheville, NC-Anderson, SC
- This is an invalid string which is longer than 50 characters including spaces.