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# Use of SEDRIS on CCTT and UK CATT

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# Objectives

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- **Provide overview of CCTT's (and UK CATT's) use of SEDRIS**
  - With some history
- **Describe key principles we applied...**
  - ...as they relate to SEDRIS
- **Thoughts relevant to big programs**
- **Discuss tools & testing capabilities in detail**

# CCTT System-Level View of SNE

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- **CCTT SNE is made up of ...**
  - Representations (or presentations)
    - Run-time databases & paper maps
  - Services
    - Software that encapsulates the run-time database formats
- **SNE is perceived by user/trainee through ...**
  - Out-the-window view in modules
  - Paper maps
  - CADRG
- **SNE is seen by operators through ...**
  - Plan View Display (electronic map)
- **SNE representations that cannot be “seen” ...**
  - Geometry, planning, and radio degradation

# CCTT SNE Content

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- **Database extents range from 46x54 to 160x160 (in km)**
- **Very complex / dense content**
  - About 10 million trees & 200k buildings in one DB
  - Up to 10k destructible objects per DB
- **Regional features**
  - Rock drops / rice paddies (Korea), compounds (Kosovo), tank crossings (Ft. Hood), wadis (NTC)
- **Complex cut and fill geometry (w/tunnels)**
- **Limitations**
  - No support for TINs or building interiors
  - Close integration with E&S image generators

# CCTT SNE Representations

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**CCTT SNE is made up of multiple presentations of data:**

- **Visual databases for man-in-the-loop**
- **Five “correlated databases” support run-time services (CDBs)**
  - MrTDB (geometry database)
  - MrsTDB (routing)
  - PVD (electronic map view)
  - Environment Manager (dynamic terrain server)
  - Radio (signal degradation from landmass)
- **Simulation Paper Maps**
- **CADRG**

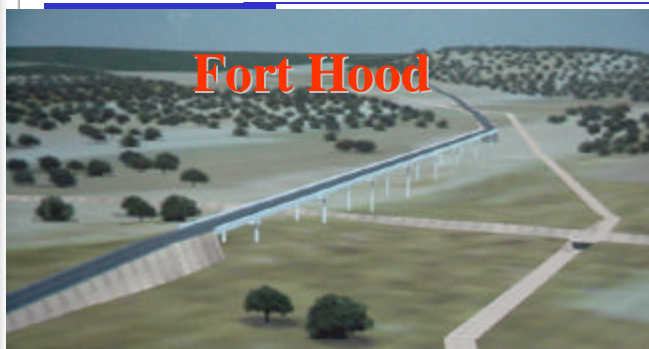
# CCTT Databases To Date

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- **Seven databases completed to date**
  - Three more under development.
- **Primary 1 and Primary 2 underwent multiple revisions throughout CCTT development**
- **Current CCTT database “regeneration” effort to re-turn the older databases using the latest database generation tool set including the SEDRIS STF process.**
  - Single “baseline” of toolsets & capabilities



# CCTT Databases



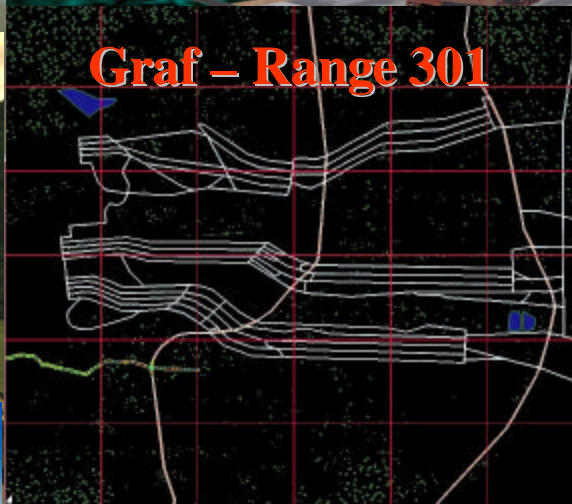
**Fort Hood**



**Korea**



**P1 – Central U.S.**



**Graf – Range 301**



**P2 – NTC**



**Kosovo  
Compounds**

**Fort Riley  
(Picture TBD)**



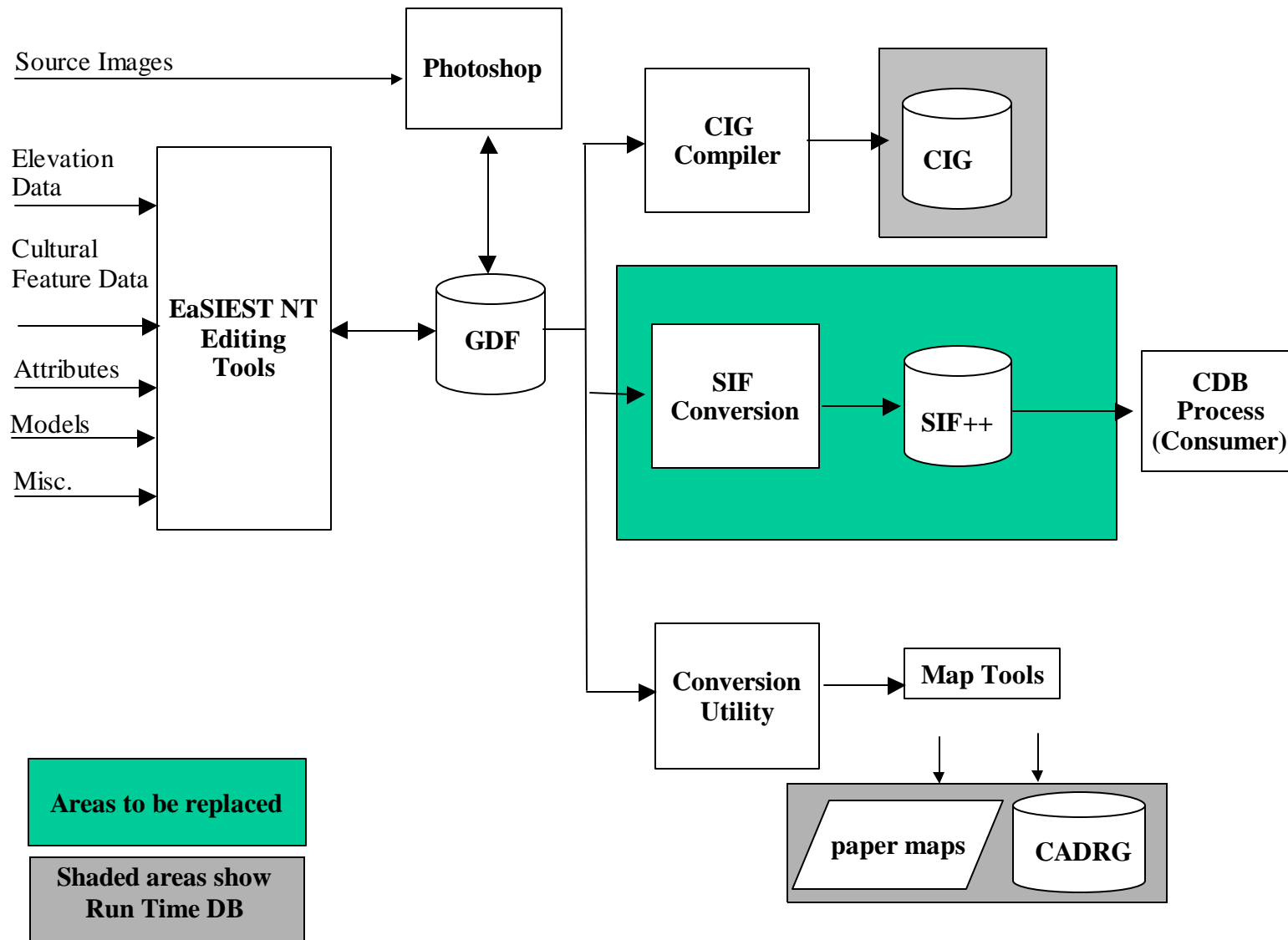
# History & Context

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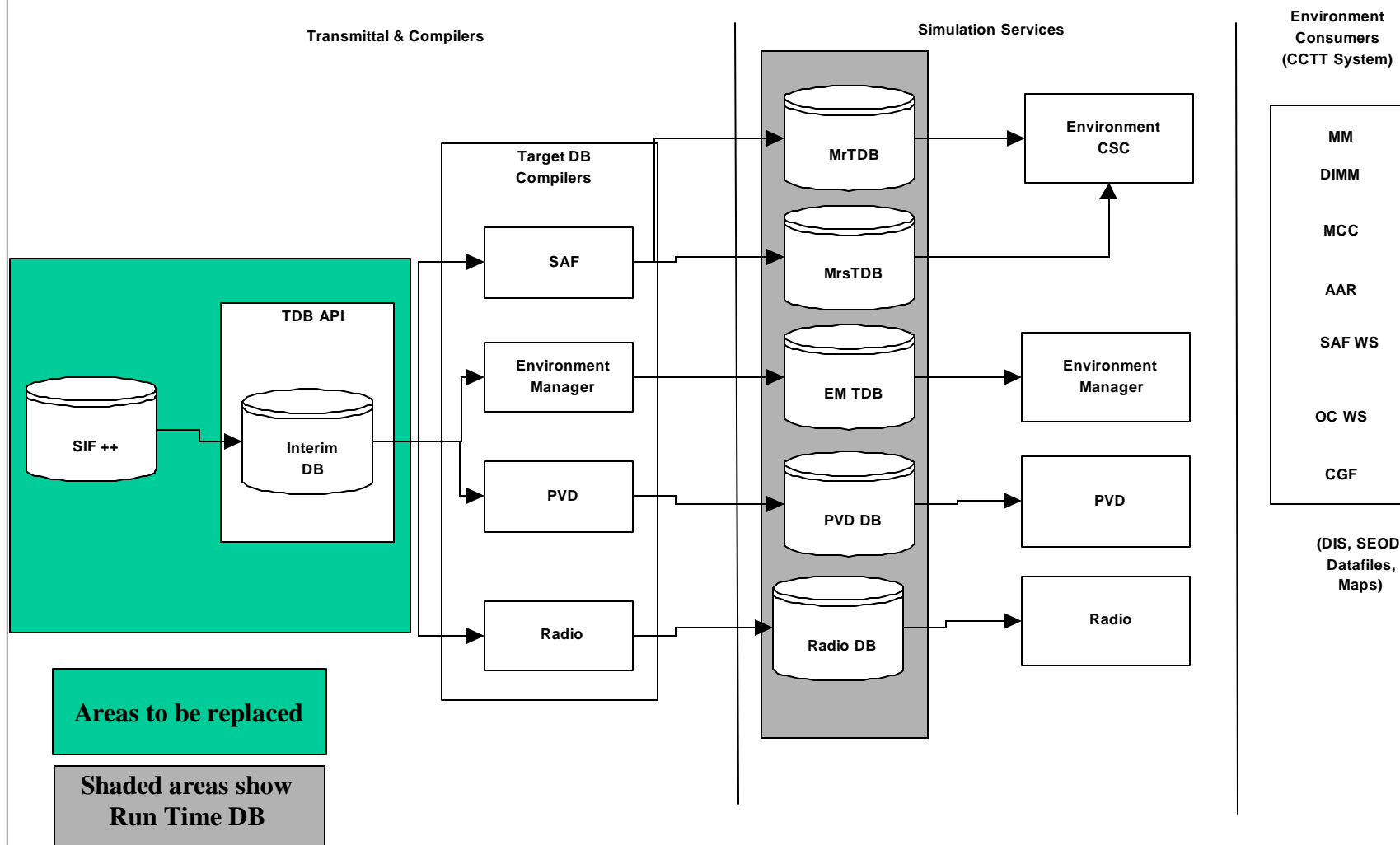
- **Close Combat Tactical Trainer Development (-1997)**
  - SNE development started late; database generation even later
  - Original requirements called for three databases, not a process
    - Significant investment in “Primary 1” (Forest) and “Primary 2” (Desert)
    - SIMNET Graf (for SIMNET interop) dropped
  - Database development tightly integrated into system context
    - Visual system needs were highest priority
  - Exchange from database producer to system was “modified” SIF
  - Basis for UK CATT reuse
- **Growing interest in new databases....**
  - ....especially for CCTT sites (e.g. Ft. Hood), but also from hot spots (e.g. Kosovo).



# Old DB Process – Producer View



# Old DB Process – Consumer (CDB) View



# Interest in SEDRIS

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- **For CCTT:**
  - Improve process all around (more databases)
  - Meet data obligations for external programs required to interop with CCTT (e.g. AVCATT)
  - Fix numerous exchange issues, like attribution requirements
- **For UK CATT:**
  - Facilitate transition to a new database producer
  - Minimize per-database development costs
- **Context for funded effort:**
  - Common process for both programs, to the extent possible
  - Run-time formats stayed the same (output is the same)
  - CCTT also funded general process improvements

# Conversion To SEDRIS – Initial Principles

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- **One process for two programs**
- **Extensive effort to document CDB requirements**
  - Ensure the data required to build CDBs was in the transmittal, not fabricated or derived in a “lossee” way
  - Labels, tree attributes, building footprints
- **STF is a “system database”**
  - Not just an exchange mechanism, not just a capture of visuals
  - (UK CATT provided only CDB information)
  - Some data derivation is still done, but this is minimized
    - Building footprints versus river/road linkages
- **Insulate run-time databases from changes**
  - Recreate existing end functionality (time, output, etc.)
- **Incorporate test solutions throughout development**
  - Early test AND late test; testing in SEDRIS alone is not enough

# Conversion To SEDRIS – TCRS

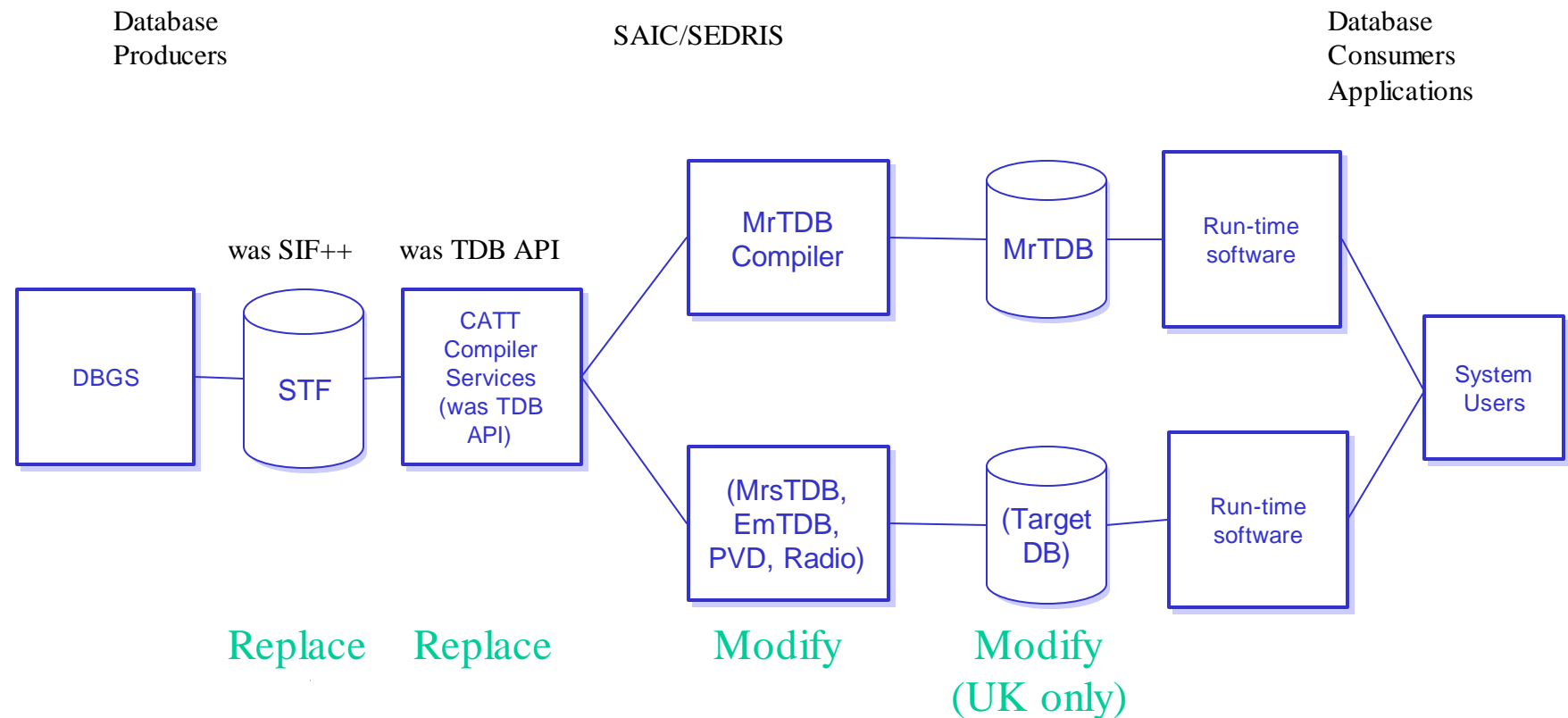
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- **Transmittal Content Requirements Specification**
  - Programmatic
    - Same document for CCTT and UK CATT (w/options!)
    - Documents CCTT oddities: can't consume any transmittal.
    - Effectively serves as documentation for other consumers as to “what's in a CCTT transmittal”
  - Attribution (similar to EDM)
    - Specifies attribution requirements for the CDBs, not visuals
    - Provides some background on system issues
    - Includes attribution not strictly required for CCTT
    - Ensures producer provided all required attribution
  - Implementation
    - Protects consumer from dealing with all valid representations
    - Collaborative environment between producer and consumer (tradeoffs)
    - Long-term hope for machine-readable requirements specification



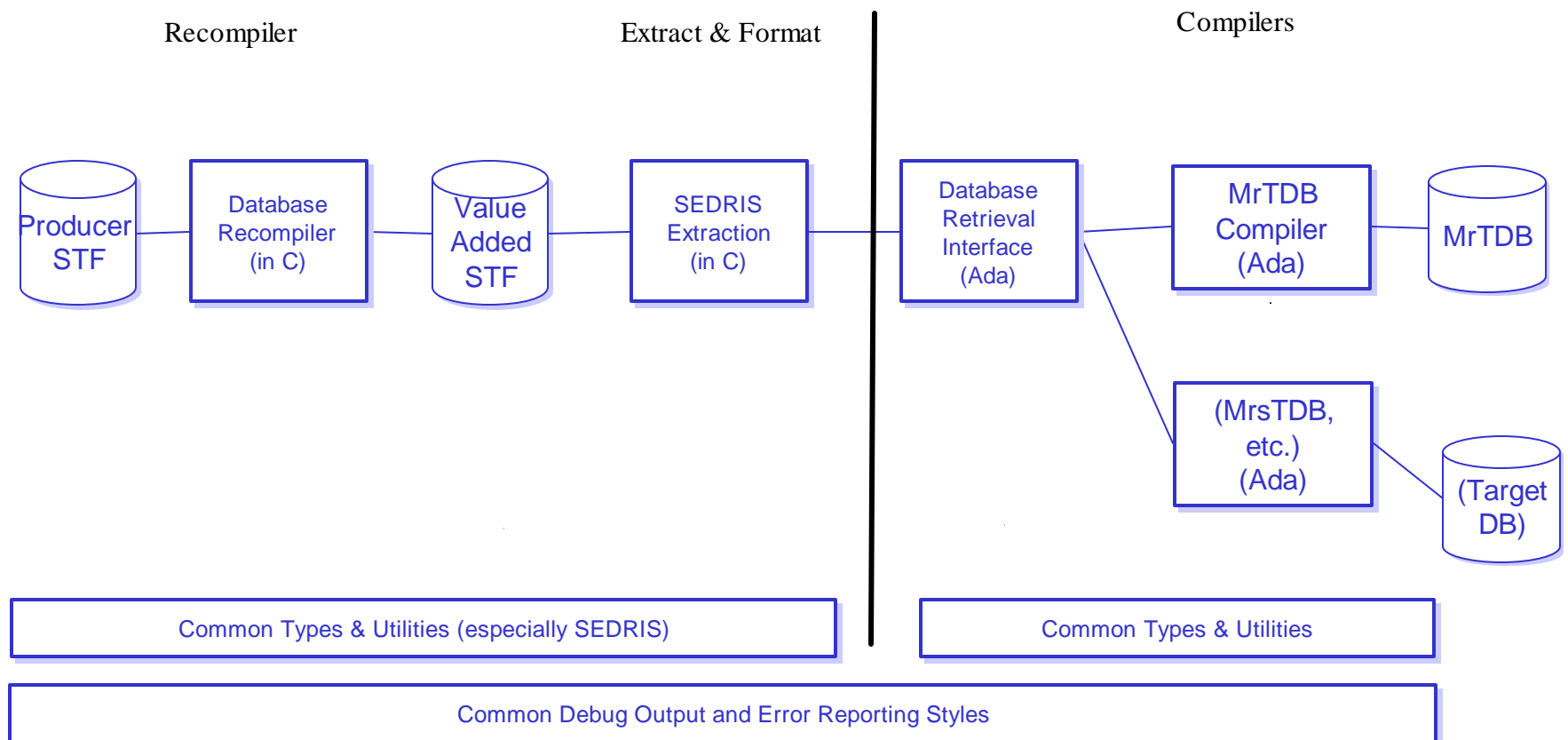
# New Process (SEDRIS-based) Comparison

- Two different producers; same CDB creation process



# New Process Components - Expanded

- Ability to “update” STFs if needed
- Common software layers



# As-Built Notes

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- **Implementation started in 2.5.2, presently 3.0.4**
  - Except UK CATT produced in 2.5.2 for last DB and up-converted
- **Recompiler has proven useful in many situations**
  - UK CATT terrain skin processing to gridded
  - Adding PVD labels, post-processing areal buildings, data repairs
- **All visual data captured in STFs, including moving models**
  - Some issues (e.g. bridges, winter)
  - Considering splitting out moving models
- **Test utilities have played a huge role in our success**
  - Details to follow

# Opportunities to Excel

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- **Large database sizes**
  - Databases up to 57 Gb
- **Processing time**
  - Mitigated via distributed processing
  - Newer tools all build Parallel/Distributed paradigms in
- **Early adopters of ITR, Feature Models**
  - But tool producers stepped up quickly
- **Hope to step process up to newer SEDRIS versions**
  - Take full advantage of newer tools and functionality
- **TCRS has been updated as new CCTT databases and representations come up**

# Lessons Learned

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- **Parallel, distributed processing**
- **If we were doing a new TCRS now...**
  - Would have used EDM for attribution
  - Should have included more detail
    - Clipping rules
    - Use of Spatially-Indexed
- **Test utilities have played a huge role in our success**
  - Test at SEDRIS, extract, run-time, and system levels
  - Tests specialized to take advantage of data available (e.g. overlap tests in run-time databases, not at SEDRIS level)
  - Focus on “usability” of test tool output



## More On the TCRS

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- **Permits straightforward compiler development**
  - Compilers don't need to have both “derive the data” and “get the data” paradigms implemented
  - Largely avoids “recognition” problem...what is this thing?
  - Severely limits ability to consume other transmittals, but...
- **Documents CCTT oddities: can't consume any transmittal**
  - CCTT CDBs have lots of special-case representations that derive from their “system” context
    - Fully gridded...even with cut and fill
    - Cut and fill, basis sets, labels
- **For outside parties: can I consume a CCTT database?**
  - Captures what data is present, helps capture “why” data is the way it is

# Impact of SEDRIS on CCTT – Low-level

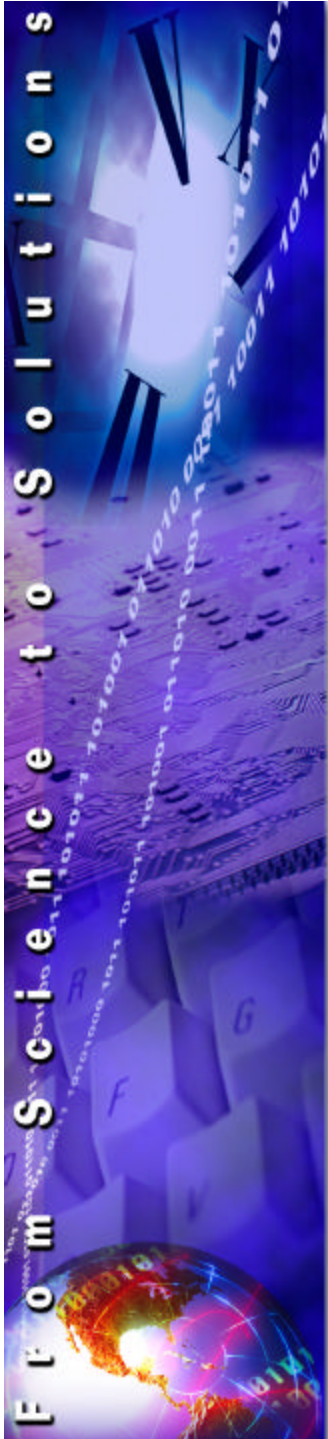
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- **Lingua franca for attribution specification, hierarchies, etc.**
  - Instantiated in TCRS, but also in engineering exchanges
- **Eliminated SIF software that reads “disk format”**
- **ITR used for distributed database creation**
- **Facilitated “two programs, one process”**
- **Made it possible for consumer to update/repair data**
- **Reuse of test tools**
  - existing test tools on CCTT
  - CCTT test tools (or concepts) in other domains

# Impact of SEDRIS on CCTT – Big picture

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- **SEDRIS versions provide relatively low-cost path for improvements (e.g. transmittal size)**
- **CCTT provides strong example of “system database” concept**
  - SEDRIS data is not just a “means to an end”
- **CCTT visual data available to outside parties**
- **SEDRIS directly used for cross-program exchange**
  - Data provided to AVCATT, OOS, SIMNET IG Rehost, CCTT IG Rehost, others
- **Engineering concepts applicable across multiple programs**
  - SEDRIS in active use on CCTT, WARSIM, OOS, AVCATT, UK CATT, etc.



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# Use of SEDRIS on CCTT and UK CATT

Tools

# Test Tools – Key Principles

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- **Parallel and Distributed Capabilities using SPDI**
  - Timely results are critical; handle huge datasets
- **Do tests at multiple levels**
  - Direct on STF, at extraction, after clipping, run-time
  - Push tests back to producer where possible
- **Do tests where they make most sense**
  - Why test something in SEDRIS when the run-time can be completed and execute the same test faster?
- **Flexible toolsets for quick updates**
  - Added tests for “fill rivers” to find spikes from DBGS updates
- **Emphasize flexible, sortable, usable output**
  - For example, CSV output easily read/imported, sorted, etc.
  - Different files for different context of tests helps localize



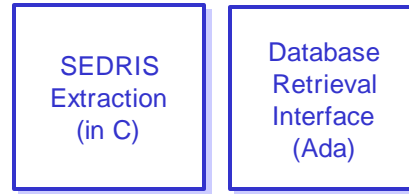
# CCTT Test Tools

## Transmittal



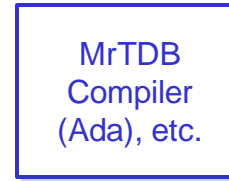
- STF Checker
- Syntax Checker
- Rules Checker
- Transmittal Browser
- Depth
- Side-By-Side Viewer

## Extract & Format



- Retrieval Tester
- Retrieval Messages
- Extract Tester
- Extract Gnuplot View
- Extract Messages

## Compilers



- Compiler Output logs
- Initialization Tester
- PO ID List File
- Terrain Type Stats File
- Linear Widths File
- Execution Timers

## Correlated Databases



- GIDGET
- AAR correlation testing
- PVD Viewer
- Radio Viewer
- EnvMgr text display
- Visual slideshow

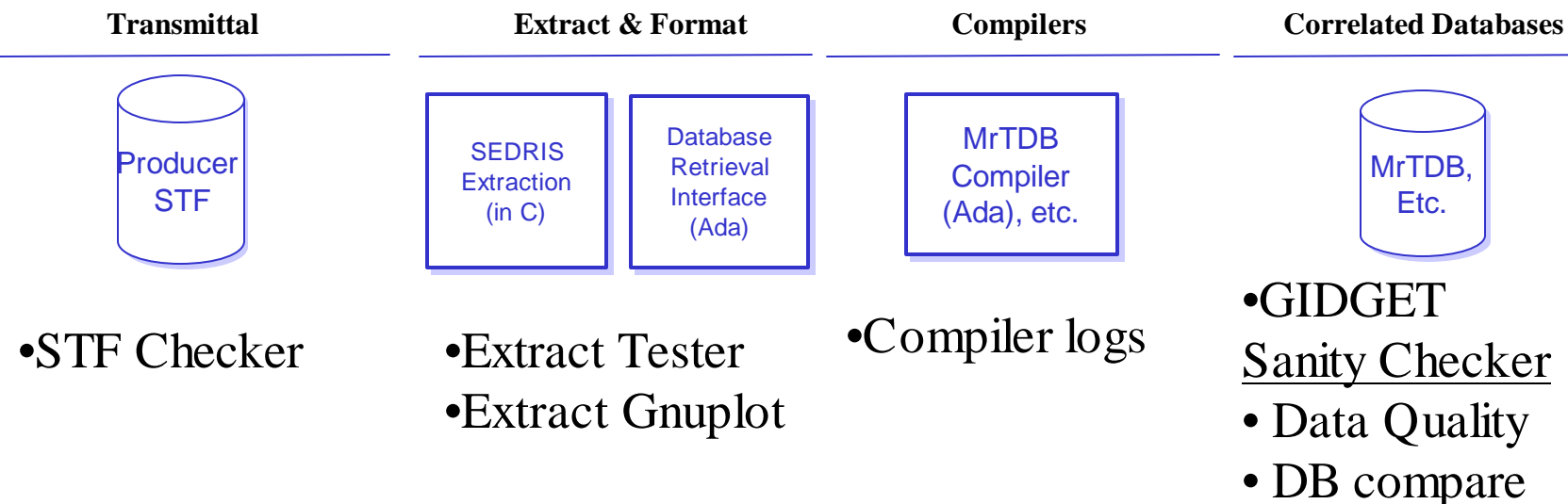
### Sanity Checker Tools

- Data Quality
- DB compare
- Visual compare

- “Viewer” Tool (e.g. text or graphical dump) at all layers that modify data
- Automated testers provide full-area coverage (STF Checker, Sanity Checker)
- Reuse of SEDRIS-based tools to evaluate transmittal
- Formal checklists capture lessons-learned and enforce consistency
- Tools common to CCTT and UK CATT except for visual slideshow (CCTT Only)

# Test Tools We Will Emphasize

## CCTT Specific Test Tools



## General Test Tools

- EDM Checker
- Mid-range Tester (concept)
- SPDI (SEDRIS Parallel / Distributed Interface)

# Test Tool: Transmittal (STF) Checker

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- **Transmittal requirements**
  - We have a written data content / attribute specification!!
- **Can be run by database producer**
  - Verifies required attributes present
  - Notes anything that can't be "classified"
  - Saves time, puts "muscle" behind requirements
  - Errors are prioritized (High / Medium / Low)
- **Data quality tests**
  - Attribution ranges, suspicious combinations
  - Matches up linear end points (for elevation)
  - Checks linear slopes by type (road, river)
  - Duplicate instances (inside models, across FMIs)

# Test Tool: Transmittal (STF) Checker

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- **Application must have short execution time**
  - No tests worse than  $O(n)$  on retrieval
  - Minimize intermediate (in-memory) storage
  - Leave that stuff to the fast run-time DBs!
- **Testing Scope Focused on TCRS**
  - ....but many smaller “info” tests as well
    - “Building side too long” (scaling errors)
    - Pre-load subtransmittals (corrupt files)
- **Outputs text, summaries, and files that may be read into other test utilities.**
  - Highly readable and informative output: priority, values, etc.
  - Easily readable (e.g. sorting in Excel)
  - Selectable tests
  - Export to “slideshow format” that allows direct viewing on run-time

# STF Checker - Linear Errors

Priority	EDCS_CC	Description	Value	Value 2
** HIGH **	DAM_OR_WEIR	Value below the acceptable range.	Main Width	1.8
** HIGH **	RIVER_OR_STREAM	Shoulder width is greater than the main width.		
** HIGH **	RAILROAD	Invalid Main STGC for a linear	20	
** HIGH **	ROAD	Value below the acceptable range.	Main STGC	0
** HIGH **	ROAD	Missing Attribution	Main STGC	
** MEDIUM **	BRIDGE_SPAN	Missing Attribution	Bridge Height	
** MEDIUM **	RIVER_OR_STREAM	At least one point is below the Spatial Domain		



# STF Checker – Areal Types

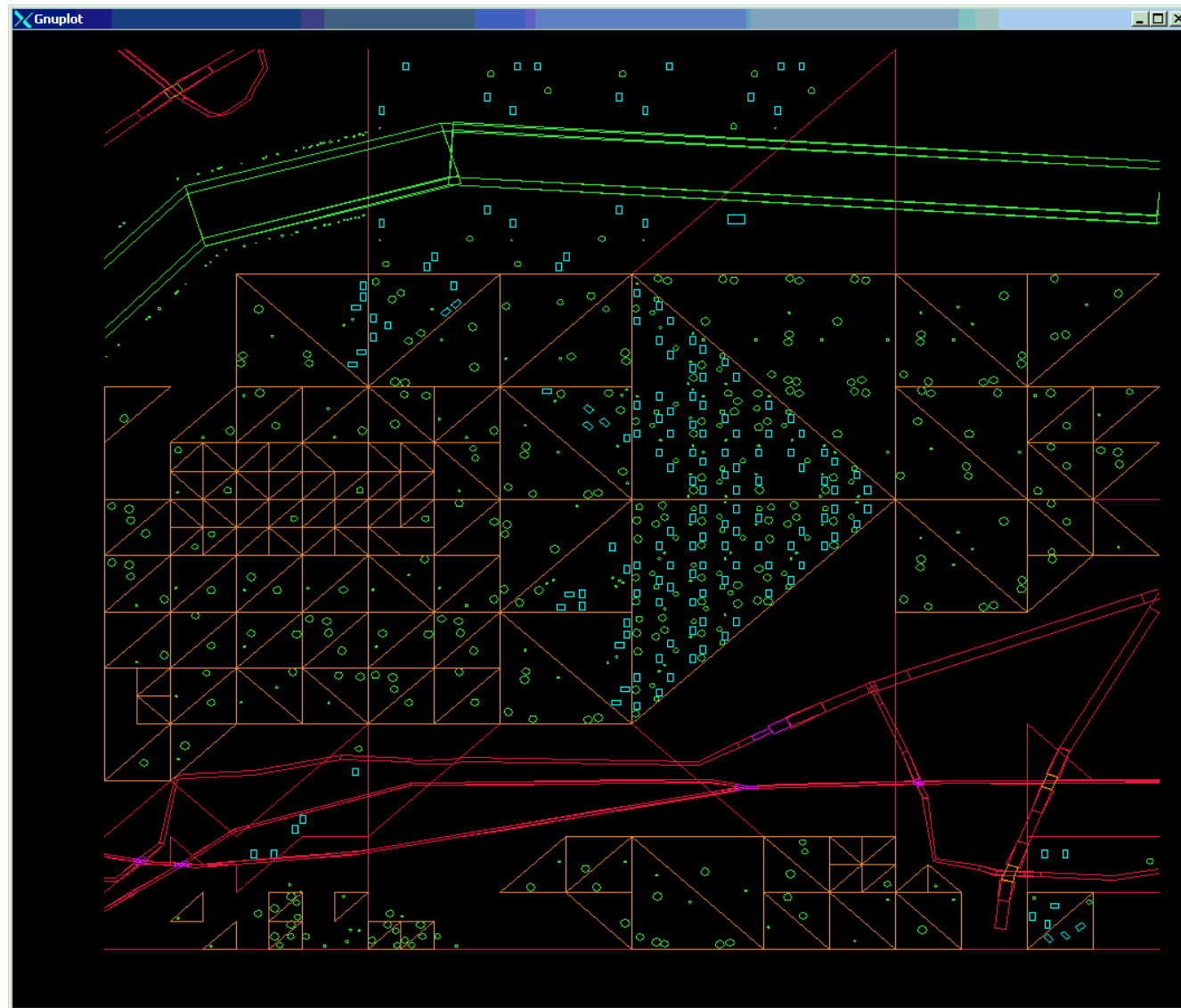
Areal Types			
Classification	ESID/TCODE	STGC	Count
EDCS_CC_BUILT_UP_AREA	ESID:a105,DESC:"Built-up Area";	20	222
EDCS_CC_CROPLAND	ESID:a300,DESC:"PHYSIOGRAPHY - Cropland (general)";	9	6675
EDCS_CC_FOREST	ESID:a70c,DESC:"Trees, Mixed(evergreen and deciduous)";	8	8896
EDCS_CC_GRASSLAND	ESID:a501,DESC:"Grassland";	7	1746
EDCS_CC_LAND_AREA	ESID:a200,DESC:"PHYSIOGRAPHY - Soil (general)";	7	6675
EDCS_CC_RESIDENTIAL_REGION	ESID:c204,DESC:"Single Family Residential";	20	1378
EDCS_CC_WATER_EXCEPT_INLAND	ESID:7500,DESC:"HYDROGRAPHY - Offshore Water(general)";	28	376

# Extract Tester

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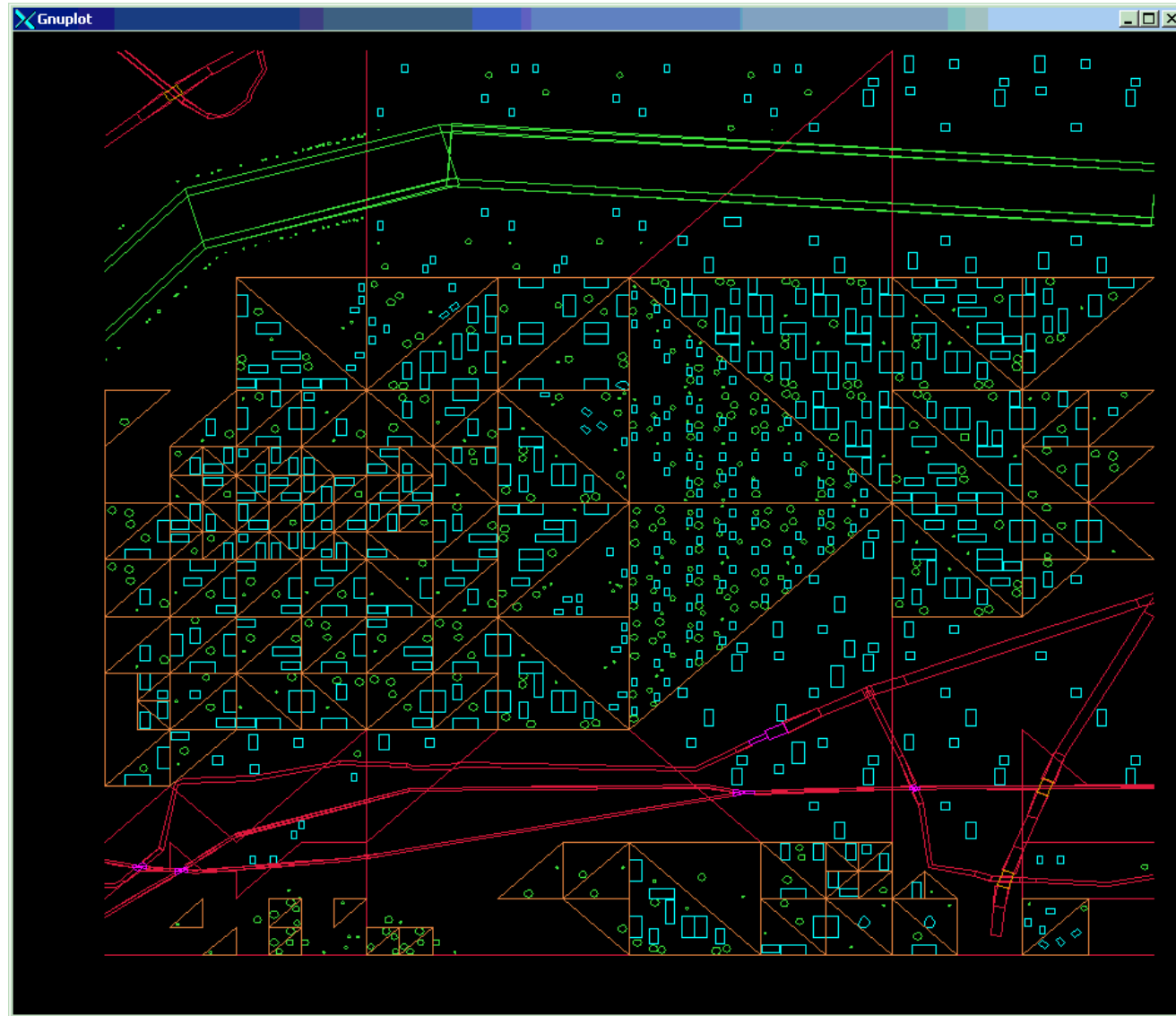
- **Using our extract library which is used by the compilers to read an STF we developed a tool to examine the SEDRIS data before the being consumed by the compilers**
  - Provide view of data before clipping and specialized
  - View captures CCTT “interpretation” or “extraction” from SEDRIS
- **Able to Identify/Examine Problems in the transmittal (STF) before and after processing by the CDB Compilers**
- **Supports Two Output Formats:**
  - Text
  - A format that can be processed by GNUPLOT to get a two dimensional visual display

# Extract Tester Gnuplot View – New DB



SEDRIS Use in CCTT and UK CATT • Jon Watkins & Jim Pivonka • STC 2004  
**SCIENCE APPLICATIONS INTERNATIONAL CORPORATION**

# Extract Tester Gnuplot View – Old DB



# Test Tool: GIDGET

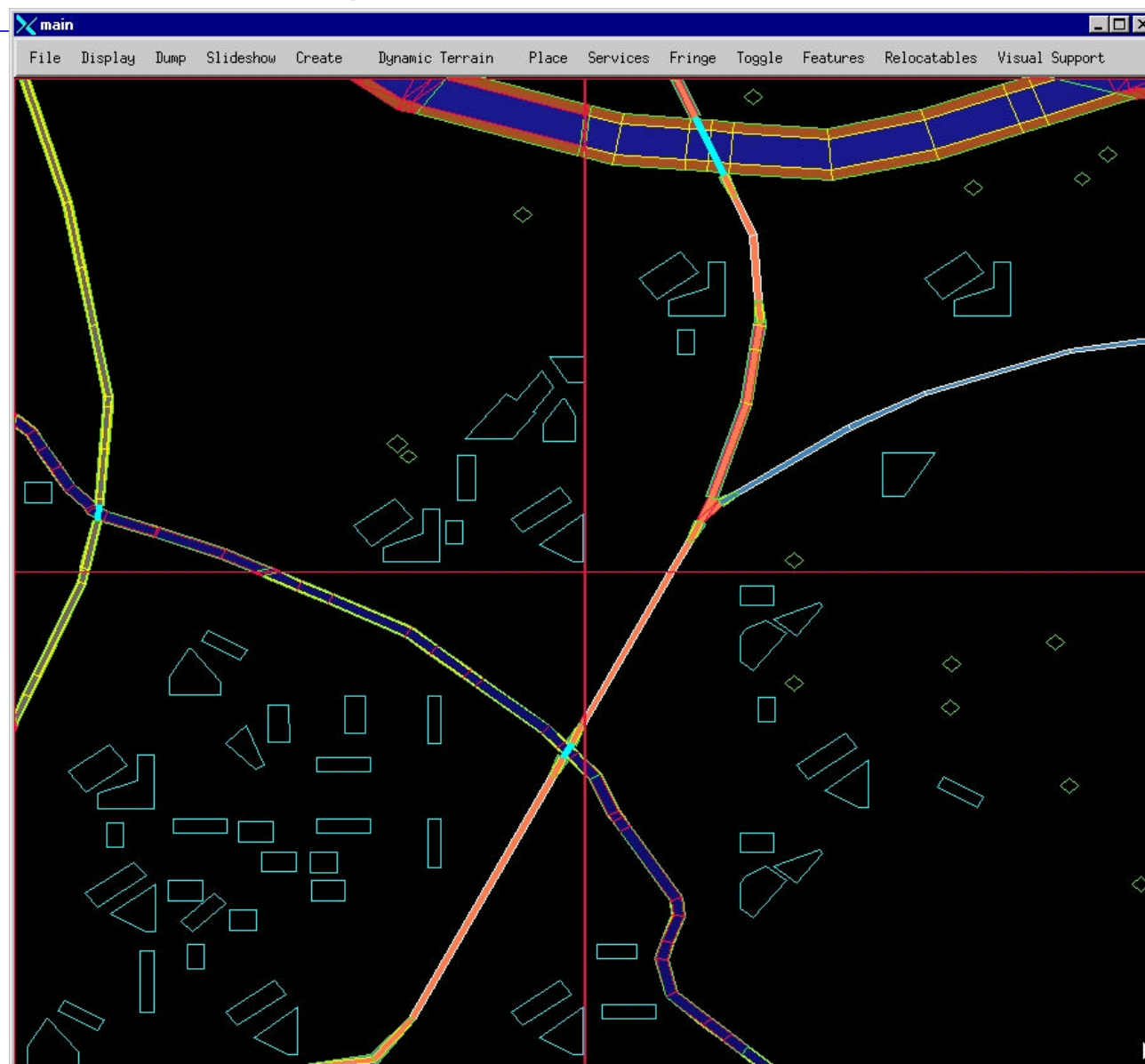
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- **Database tester**
  - GIDGET is a plan-view that displays CDB data, not PVD data
  - Allows for a graphical view of the CDB data sets
  - Allows examination and test of CCTT Environment functionality on a database
- **Supports “native” database test:**
  - 2D & text “view” of MrTDB and MrsTDB
  - Partial 3D view of MrTDB using VRML
- **Supports regression and software test**
  - Executes all external software operations that operate on MrTDB and MrsTDB
- **Support Correlation Testing:**
  - Allows visual comparison of database products (with Visual and PVD)

# GIDGET Main Display

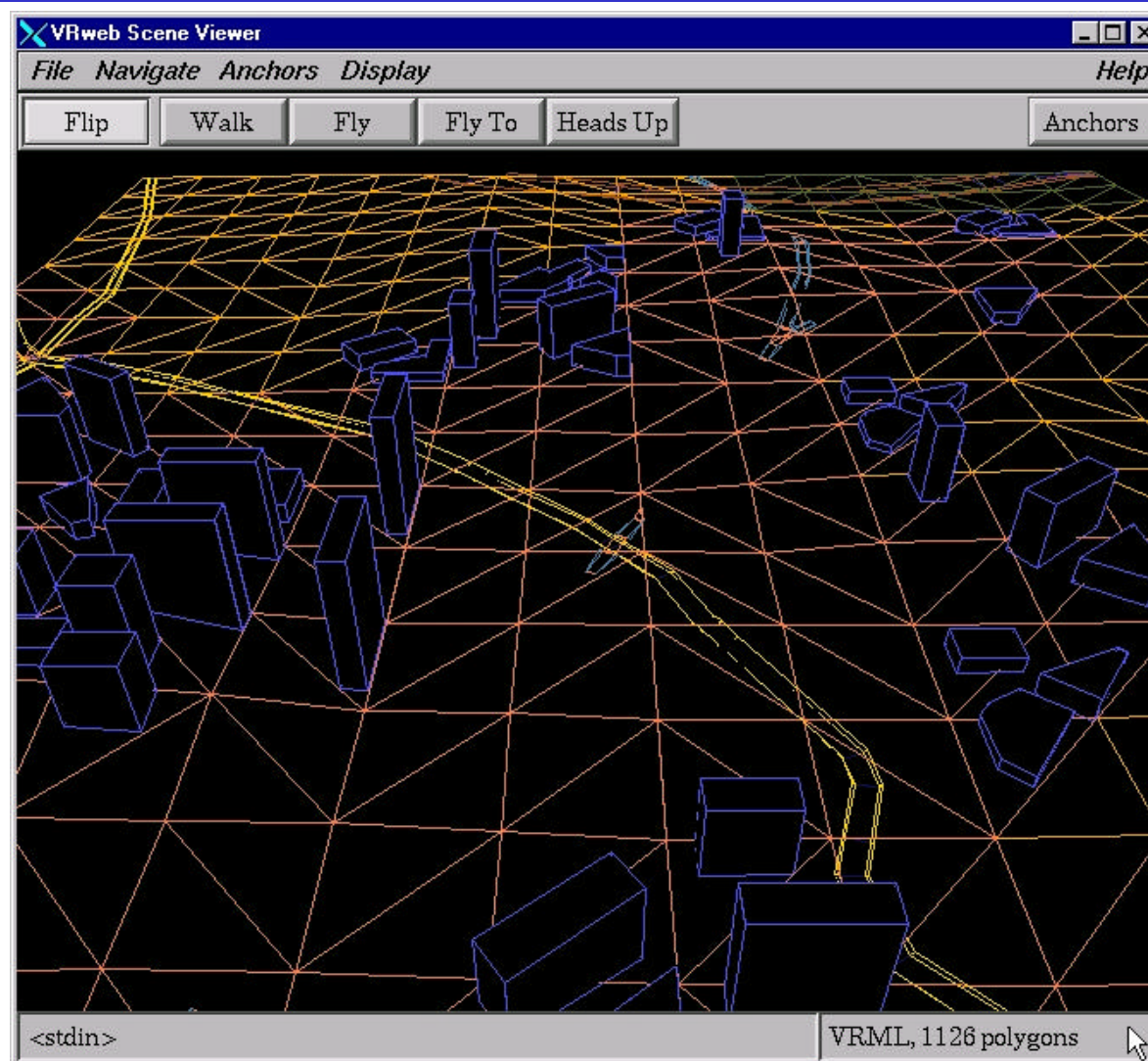
- Orange – Paved Road
- Light Blue – Dirt Road
- Dark Blue – River
- Grey – Railroad
- Cyan – Bridge Span
- Yellow Outline – Cut & Fill
- Brown Outline – Cut & Fill Green
- Diamonds – Trees
- Blue Squares – Buildings

**Korea DB**





# GIDGET VRML Export





# Test Tool: Sanity Checker (SC)

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- **Data Quality**
  - Tree/Building on lake/road, etc.
- **Data Search**
  - Find all railroad spans that cross a clipping boundary but do not cross water
- **Automated comparison between DB Versions**
  - What changed in P1AH versus P1AG?
- **Automated comparison between CDBs**
  - Do PVD and MrTDB agree on buildings and lakes?
- **Specialized Tests / Visual Compare**
  - Visual Compare for elevation only; used for cut & fill tests
  - Find 1 instance of each building or tree model
  - Walls (cuts) of china

# Sanity Checker – Generic Engine

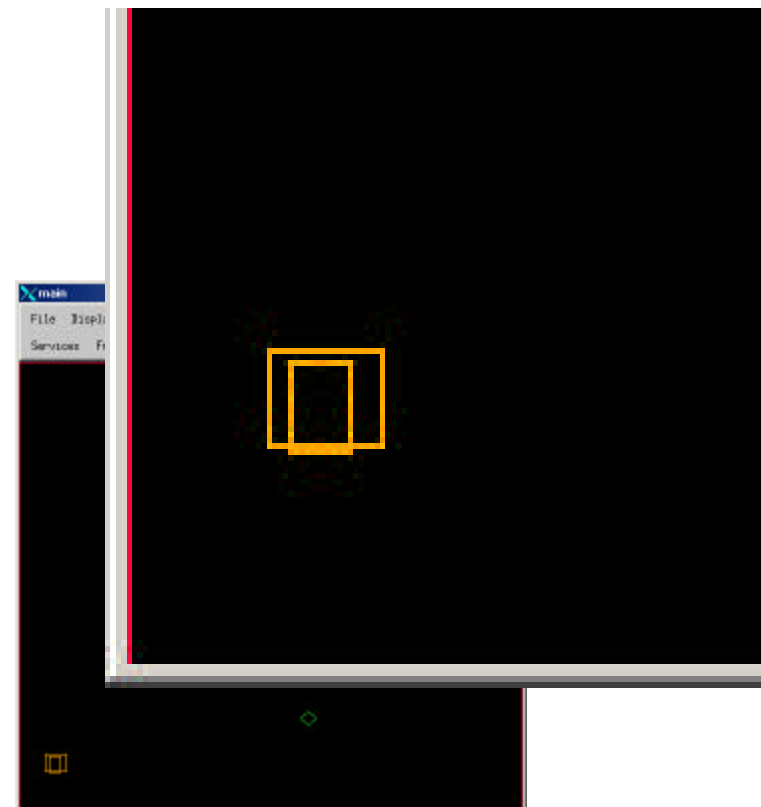
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- **Area: Extents, subdivision size**
- **Selectable output:**
  - GIDGET Slideshow, screen, file, verbose, etc.
- **Function**
  - Display, (no) overlap, (no) duplicate, inside, encompass, visual\_compare
- **Feature**
  - Generic: Building, Tree, Linear, Span, Tree, etc...
  - Specialized: Tree\_Trunk, Linear\_With\_Shoulder, etc.
- **Attributes**
  - Lots! (Destructible, cross clipping boundary, no\_go, water, ramp, Has\_Terrain\_Type, Has\_Model\_Id, appliqué, etc.)

# Miscellaneous SC Test Examples

- Feature overlaps
- Duplicate features
- Features overlapping clipping boundaries
- Count instances of a particular model
- Compare database-to-database (e.g. two version of MrTDB or MrTDB versus PVD)
- Slopes of linears
- All spans over railroad
- All destructible buildings overlapping trees of a particular model id
- ... .etc.
- *All results easily viewed on CDBs and/or visuals*

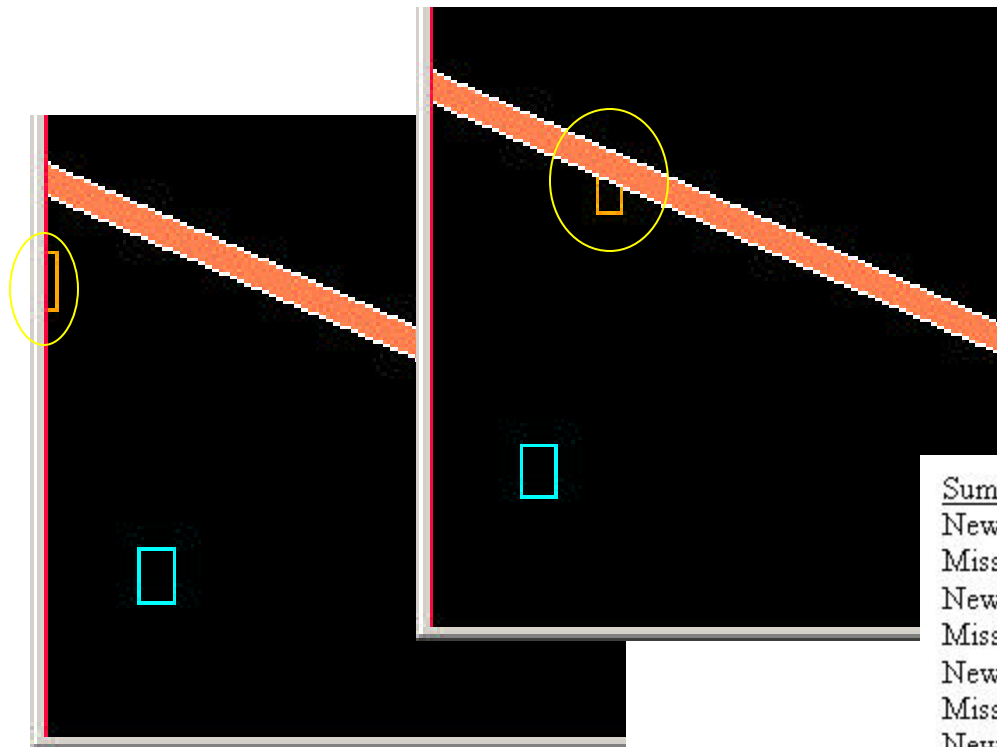
Kosovo  
Building Overlap



# DB Comparisons: Find Changes

- Building shifted onto road during database update (change & error)
- Comparison tests for placement of all feature types

Updated Grafenfels



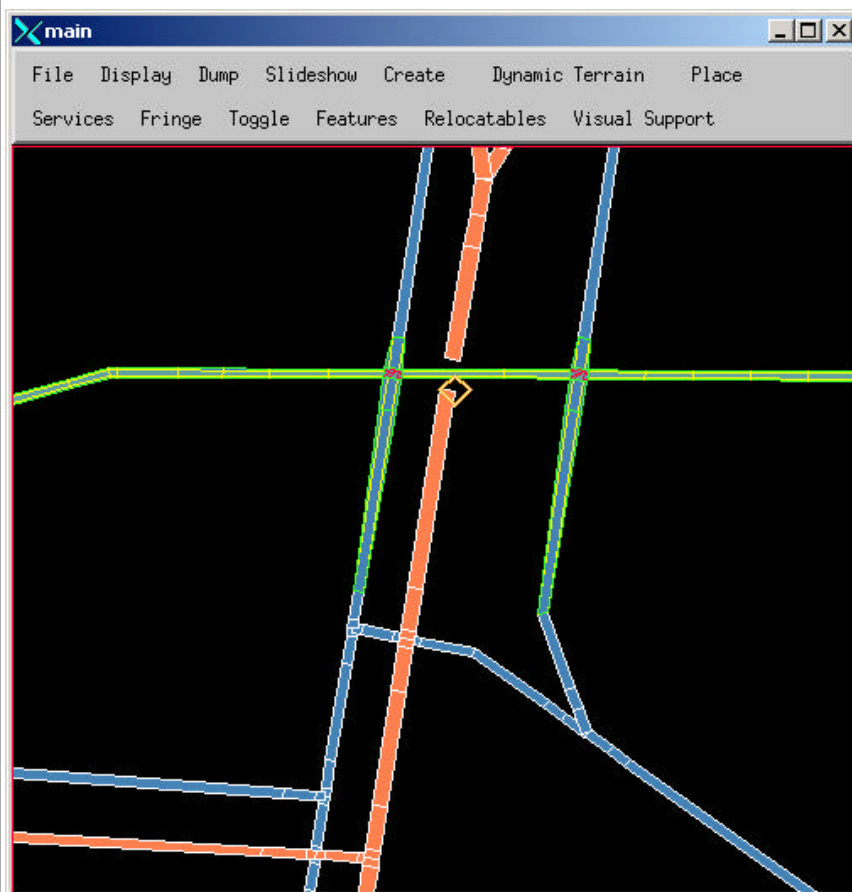
Original Grafenfels

Summary of test totals:

New\_span\_in\_new\_DB: 7 / 179 = 3%  
 Missing\_span\_in\_new\_DB: 4 / 176 = 2%  
 New\_areal\_in\_new\_DB: 38 / 530 = 7%  
 Missing\_areal\_in\_new\_DB: 2 / 468 = 0%  
 New\_building\_in\_new\_DB: 61 / 27584 = 0%  
 Missing\_building\_in\_new\_DB: 78 / 27614 = 0%  
 New\_linear\_in\_new\_DB: 717 / 19393 = 3%  
 Missing\_linear\_in\_new\_DB: 54 / 16421 = 0%

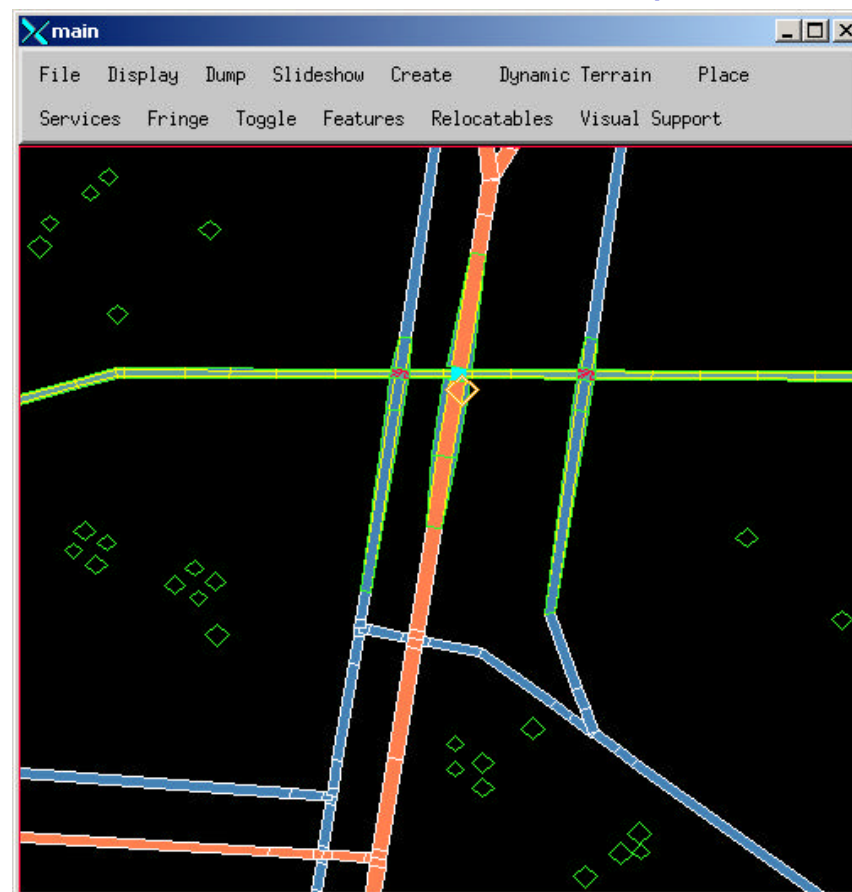
# Repairs During Development

Fort Hood Test Drop



Missing Bridge Reported

Fort Hood Final Drop

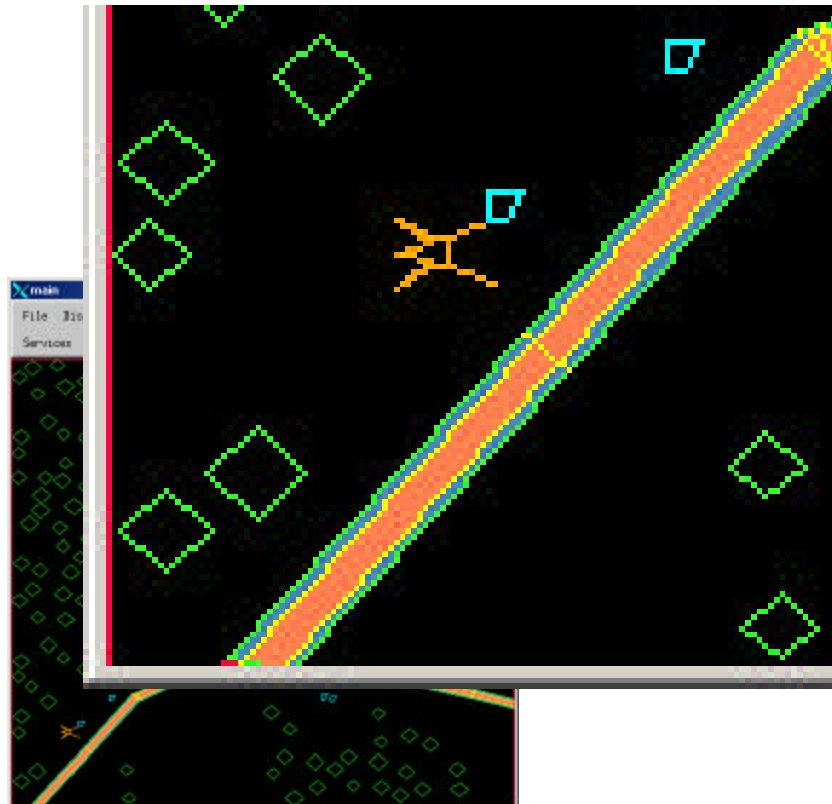


Bridge Repaired

# “One Each” tests

- Identify one instance of each building or tree model, each terrain type, each linear type, etc.

Kosovo  
Bad Footprint



Primary 1  
Data on Linear Terrain Types

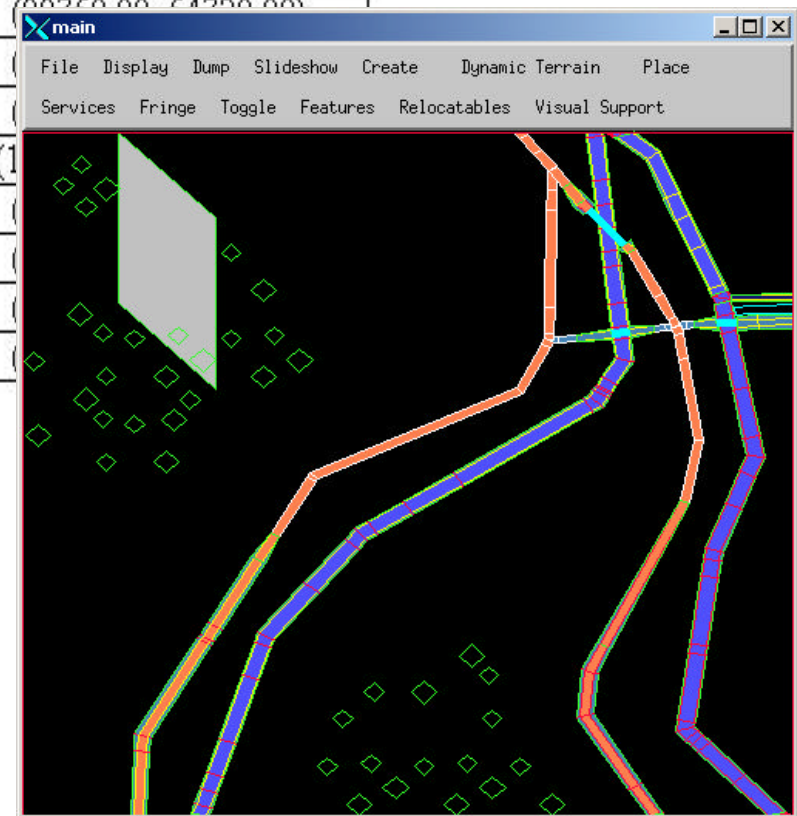
\*\*\*\*\*  
Cut Fill Linear Terrain Type Stats  
\*\*\*\*\*

Terrain Type	Sample Location	# Instances	Percentage
5	( 38326.08, 7119.95)	334	7.9
12	( 14788.06, 1721.71)	283	6.7
13	( 269.53, 479.99)	2067	49.0
20	( 7240.03, 1151.49)	1120	26.5
28	( 34176.86, 21119.99)	30	0.7
29	( 32159.99, 390.69)	378	9.0
30	( 44596.40, 1257.33)	8	0.2

# Linear Densities: Performance Problems

Linear_Densities: Number of Vertices		
Rank (1 - 10)	Number	Location
1	186	(42720.00, 29280.00)
2	182	(90240.00, 13440.00)
3	164	(00260.00, 64200.00)
4	154	(
5	151	(
6	150	(1
7	148	(
8	144	(
9	144	(
10	144	(

Korea

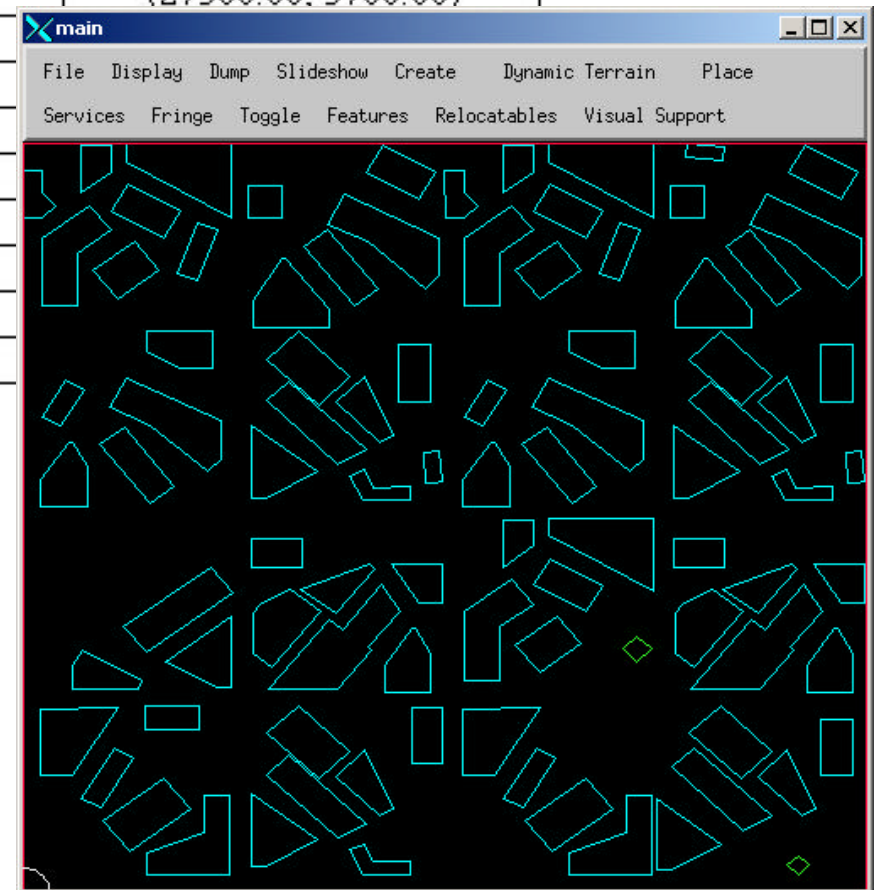




# Building Densities: Planning Problems

Building_Densities: Number of Vertices		
Rank (1 - 10)	Number	Location
1	407	(27840.00, 6240.00)
2	405	(27360.00, 5760.00)
3	397	
4	374	
5	359	
6	358	
7	355	
8	352	
9	348	
10	347	

Kosovo



# Feature Counts and Densities

Feature Type	Fort Hood (VMK)		Kosovo		Ft. Hood (VMJ)	
	Count	count/km <sup>2</sup>	Count	count/km <sup>2</sup>	Count	count/km <sup>2</sup>
Bridge	0	0.00	0	0.00	163	0.07
Overpass	179	0.07	838	0.03	13	0.01
<b>Bridge+Overpass</b>	<b>179</b>	<b>0.07</b>	<b>838</b>	<b>0.03</b>	<b>176</b>	<b>0.07</b>
Non-Destructible Bldgs	27406	11.09	219310	9.14	27427	11.10
Destructible Buildings	178	0.07	9069	0.38	187	0.08
<b>Buildings</b>	<b>27584</b>	<b>11.17</b>	<b>228379</b>	<b>9.52</b>	<b>27614</b>	<b>11.18</b>
Trees	1851898	749.70	10146043	422.99	1810568	732.96
Bushes	0	0.00	0	0.00	0	0.00
<b>Trees+Bushes</b>	<b>1851898</b>	<b>749.70</b>	<b>10146043</b>	<b>422.99</b>	<b>1810568</b>	<b>732.96</b>
Steep Slope Areal	45	0.02	36712	1.53	44	0.02
Lake Areal	530	0.21	2116	0.09	468	0.19
No Go	0	0.00	80	0.00	0	0.00
<b>Areals</b>	<b>575</b>	<b>0.23</b>	<b>38908</b>	<b>1.62</b>	<b>512</b>	<b>0.21</b>
Railroad	366	0.15	2406	0.10	347	0.14
River	589	0.24	32578	1.36	511	0.21
Road	18438	7.46	56618	2.36	15563	6.30
<b>Linears</b>	<b>19393</b>	<b>7.85</b>	<b>91602</b>	<b>3.82</b>	<b>16421</b>	<b>6.65</b>
C&F Road	4241	1.72	45712	1.91	7284	2.95
Microterrain	14636	5.93	167305	6.97	11926	4.83

# “Test/Inspection Report”

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- **Results culminate in a detailed report**
  - Raw data provided, but reports “boils down results” with key samples
  - Textual interpretation/explanation of data provided
  - Predicted impacts to system use listed
  - Great resource for future database improvements and/or to identify problems found at sites

# EDM Checker

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- **Unlike STF Checker, the EDM Checker is a generic tool that handles all transmittals**
  - “Does this transmittal meet my EDM’s requirements?”
  - Tailored to meet immediate needs of OOS, WARSIM, CCTT
- **Has Three Modes**
  - Summary: provides a summary of all the EDM’ish objects in a transmittal listing their DRM class, Classification Code, Attribution and Count
  - Discrepancy Reporter: reads in an EDM and verifies that the EDM’ish objects are in compliance
  - Fixer: compares the EDM’ish objects in the transmittal with an EDM and will do the following with select attribution:
    - Missing Attribution: Add default (if default available)
    - Out of Range Attribution: Correct with default
- **SPDI enabled version as well as serial version**

# EDM Checker: Sample Summary Output

DRM Class: Polygon

Classification Code: TERRAIN

Count: 266

Attributes:

TEXT\_ATTRIBUTE

SOIL\_WETNESS\_CONDITION DRY

SOIL\_TYPES CL\_INORGANIC\_CLAYS\_OF\_LOW\_TO\_MEDIUM\_PLASTICITY

VEGETATION\_CHARACTERISTIC DRY\_CROPS

USAGE AGRICULTURAL

SURFACE\_TRAFFICABILITY\_GROUP\_CCTT 9

SURFACE\_MATERIAL\_CATEGORY SOIL

DRM Class: Linear Feature

Classification Code: BRIDGE\_SPAN

Count: 165

Attributes:

BRIDGE\_FUNCTION\_CATEGORY RIVER\_OR\_STREAM

BRIDGE\_OR\_BRIDGE\_SUPERSTRUCTURE\_CATEGORY GIRDER

NAME

OVERALL\_HEIGHT\_OF\_BRIDGE 7.5 meter

SURFACE\_MATERIAL\_CATEGORY CONCRETE

SURFACE\_TRAFFICABILITY\_GROUP\_CCTT 20

FEATURE\_IDENTIFICATION\_NUMBER

WIDTH 9 meter

# EDM Checker: Sample Discrepancy Output

DRM Class: Linear Feature

Classification Code: ROAD

Count: 2

Attributes:

SURFACE\_TRAFFICABILITY\_GROUP\_CCTT      ATTRIBUTE MISSING!

WIDTH      ATTRIBUTE MISSING!

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,125,1

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,127,32

DRM Class: Point Feature

Classification Code: BUILDING

Count: 139

Attributes:

BUILDING\_FUNCTION\_CATEGORY      ATTRIBUTE MISSING!

HEIGHT\_ABOVE\_SURFACE\_LEVEL      ATTRIBUTE MISSING!

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,143,68

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,143,72

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,143,76

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,143,86

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,143,90

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,144,72

Object Id: urn:sedris:stf:stf\_belle.stf:1:0,144,78



## SPDI – SEDRIS Parallel and Distributed Interface

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- Developed under the DoD HPCMP PET Program
- Provides an interface to facilitate the parallelization of SEDRIS applications
- The following SEDRIS checkers were parallelized under the effort:
  - Syntax Checker
  - Rules Checker
- Running on a local eight processor Beowulf cluster, can run Syntax Checker on our larger transmittals in hours instead of days
  - In the case of Kosovo >50 hours serial versus 7 ½ hours parallel



# SPDI Syntax Checker Results

SPDI Syntax Checker Timing and Analysis (SEDRIS 3.0.4)						
Type		ITR Transmittals		Non-ITR Transmittal		
Name		Korea	Graf	Primary 2	UK CATT	Salisbury
Size		21 GB	7.7 GB	2.4 GB	1.4 GB	0.29 GB
Objects		680629385	250064444	108235234	63323884	12214763
Errors		31533	1167	4086381	1599740	332061
Serial	Time	23:28:23	11:33:20	4:18:23	2:14:28	0:21:06
Four	Time	7:38:38	3:31:17	1:03:31	0:37:47	0:06:29
Processor	Speed-Up	307.08%	328.15%	406.80%	355.89%	325.45%
Beowulf	Efficiency	0.7677	0.8204	1.0170	0.8897	0.8136
Eight	Time	3:22:57	1:46:08	0:32:59	0:19:35	0:03:05
Processor	Speed-Up	693.96%	653.27%	783.38%	686.64%	684.32%
Beowulf	Efficiency	0.8674	0.8166	0.9792	0.8583	0.8554

## “Concept” Tool: Mid-Range Tester

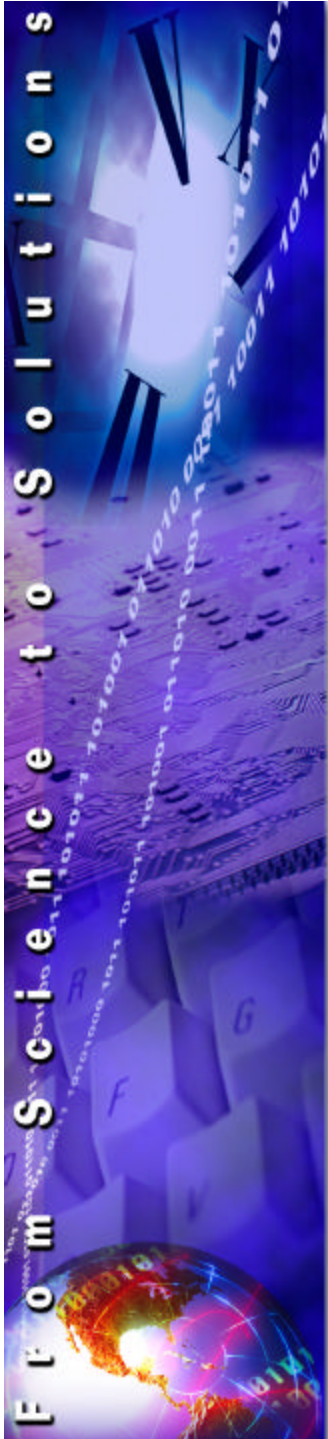
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- **By “Mid-range” we mean a wide middle ground of missing test functionality**
  - Conceptually falls somewhere between Syntax Checker and SEE-IT
  - Does simple tests that are not covered by existing SEDRIS tools on the native SEDRIS data without converting to an optimized format
- **In a quick internal experiment with a sample test, found flaws in several transmittals from big Army programs**

## Example “Mid-Range” Tests

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- All Polygons have at least three points that form a surface
- Minimum Surface Area Check For Polygons
- Areal Features are closed
- Locations that are used to form other primitive objects such as Linear Features, Areal Features and Polygons do not double back



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Questions or Comments?