

# WIM Net – An Enterprise Architecture for WIM Data

Presented by  
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# Experience at VicRoads

- Establishing a software architecture to manage 30 lanes of WIM data
- Using WIM Net – web based data administration and QA tool
- All heavy VBV data online ( $> 10^7$ )
- Reports to consumers within 24 hours of collection
- Use only desktop PC hardware

# So much data!



- Huge data sets
- Vehicles have variable length records
- Similar problem to origin-destination analysis with train tickets or phone calls

# Data management system requirements

- Multiple data file formats: in and out
- Strict QA process
- Yesterday's vehicle-by-vehicle data available today
- Aggregated data for a consolidated presentation system (using GIS)
- Self service over the internet / intranet

# Historical solutions

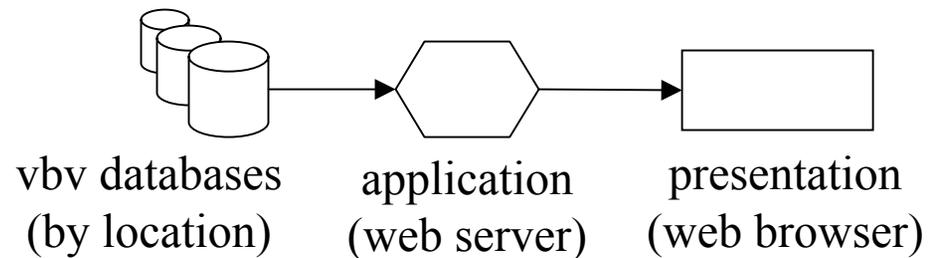
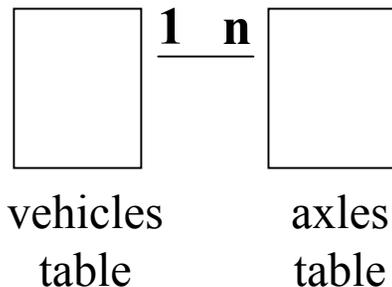
- Primary storage is aggregated (e.g. by hour)
- Limit logging
- Truncate records (e.g. to 10 axles)
- “Stovepipes” – point to point solutions using: WIM vendor’s software, Excel, Access, some\_conversion\_utility.exe, etc

# These solutions were stretched

- Analysis of VBV data e.g. frequency of distances between heavy vehicles
- Correction of data e.g. correct daylight savings errors or adjust masses
- WIM administrator hands over management of the software reporting utilities

# An architectural approach ...

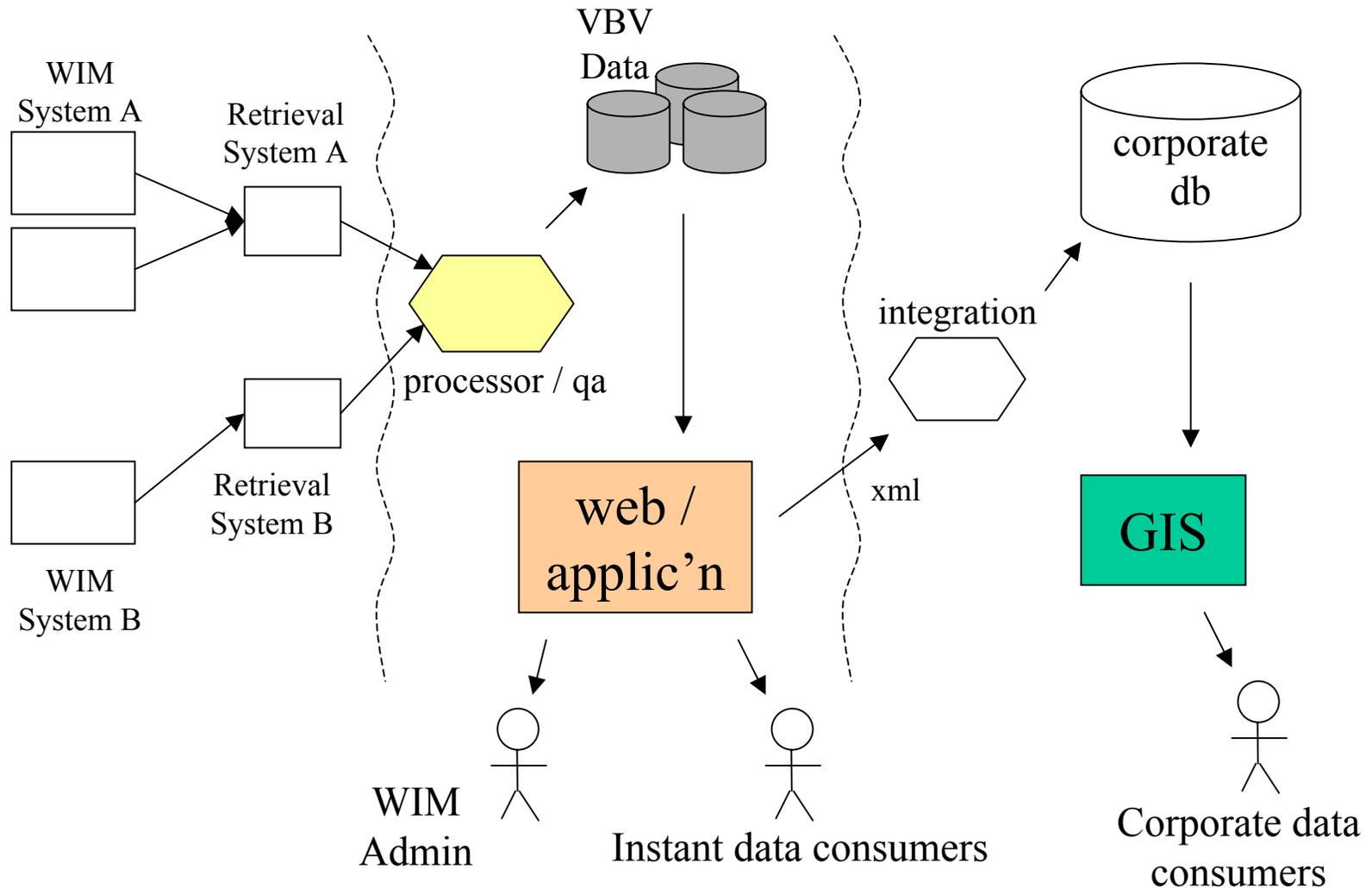
- Relational design of vehicle database: vehicles and axles tables
- Split databases by location
- Distributed “tiers” for scalability:  
data – application – presentation



## ... results in

- Every axle of every vehicle stored (no truncation and no wasted space in database)
- All data continuously online
- Use only desktop-grade hardware
- Scalable – able to add more user, sites and hardware

# WIM in the “Enterprise”



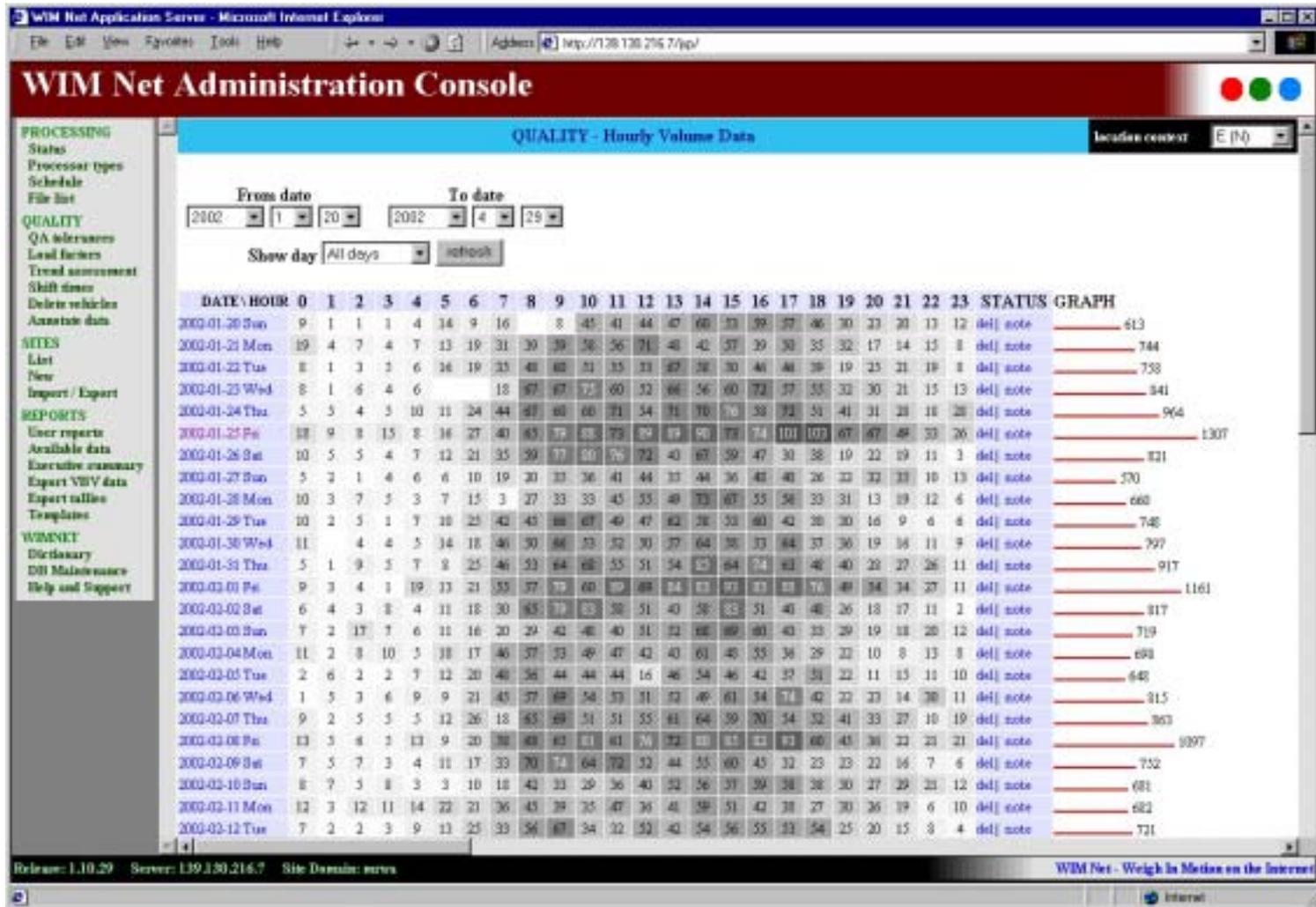
# Roles in the Enterprise

- Administrator: ensures quality, decides what data is available and who should view it
- Instant data consumers: want yesterday's data today.
- Corporate data consumers: want summaries, relationships between WIM data and other data sources (e.g. budget, condition, crash stats, etc)

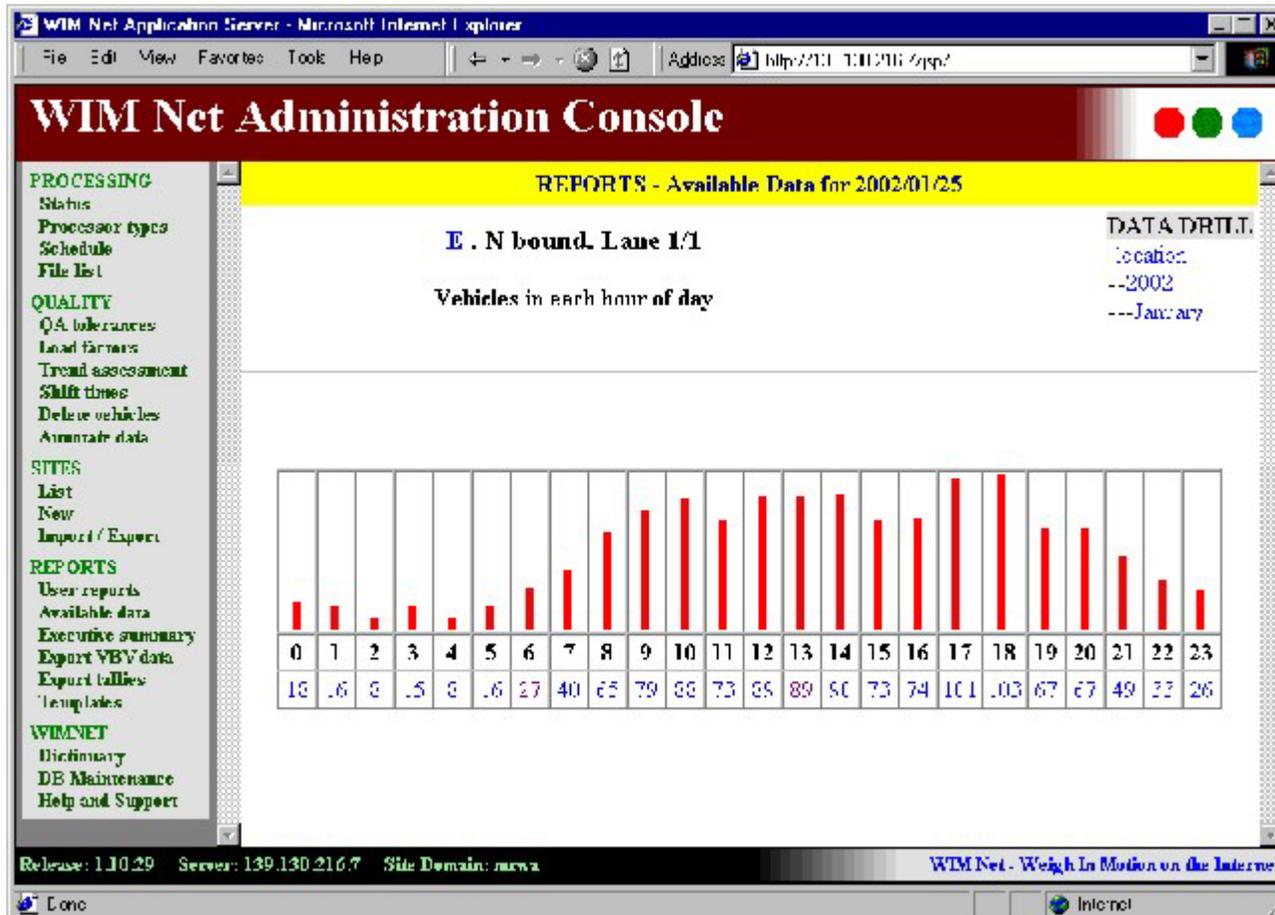
# Progressive Quality Assurance

- Data quality improves with use.
- Approach is “optimistic” – all data considered good until the administrator corrects it.
- Automatic system and VBV checks
- Periodic trends assessments driven by the administrator
- Ad-hoc assessments done by instant data consumers.

# Hour vs. day density



# Drill to hourly volume in day



# Drill to vehicles in hour

The screenshot shows the WIM Net Administration Console interface. The main content area displays a report titled "REPORTS - View Individual Vehicles" for "E . N bound. Lane 1/1". It indicates that there are 8 vehicles. A "DATA DRILL" section on the right allows filtering by location, year (2002), month (January), and day (Fri 25). Below this is a table with columns: Id, Date Time, Axles, Groups, Speed (kph), and GVM (tn). The table lists 8 vehicle records with their respective details.

Id	Date Time	Axles	Groups	Speed (kph)	GVM (tn)
10933506	2002-01-25 04:23:45	2	2	105	0
10933507	2002-01-25 04:24:05	2	2	106	11
10933508	2002-01-25 04:25:05	11	5	103	44
10933509	2002-01-25 04:25:21	2	2	101	0
10933510	2002-01-25 04:34:16	6	3	96	24
10933511	2002-01-25 04:47:37	2	2	103	0
10933512	2002-01-25 04:53:06	9	4	103	67
10933513	2002-01-25 04:55:57	2	2	117	0

Release: 1.10.29 Server: 139.130.216.7 Site Domain: mrvw WIM Net - Weigh In Motion on the Internet

# Drill to individual vehicle

WIM Net Application Server - Microsoft Internet Explorer  
 Address: http://139.130.216.7/jsp/

## WIM Net Administration Console

**PROCESSING**

- Status
- Processor types
- Schedule
- File list

**QUALITY**

- QA tolerances
- Load factors
- Trend assessment
- Shift times
- Delete vehicles
- Annotate data

**SITES**

- List
- New
- Import / Export

**REPORTS**

- User reports
- Available data
- Executive summary
- Export VBV data
- Export tallies
- Templates

**WIMNET**

- Dictionary
- DB Maintenance
- Help and Support

**REPORTS**

**E . N bound. Lane 1/1**

Vehicle #10933508  
20020125 0425-05.162

DATA DRILL  
[-location](#)  
[--2002](#)  
[---January](#)  
[----Fri 25](#)  
[-----04 AM](#)

Previous Next Jump  Delete?

44.7 tn	103 kph	27.10 m	3.1 ESA	Class 11
⊗	⊗ ⊗	⊗ ⊗ ⊗	⊗ ⊗	⊗ ⊗ ⊗
Mass 6.7	5.6 5.6	3.7 3.7 3.7	3.4 3.4	3.0 3.0 3.0
Spacing	4.33 1.31	5.75 1.25 1.25	4.10 1.31	5.30 1.25 1.25

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# Strategic Benefits

- Existing consumers are engaged to define their requirements
- Self-serve reporting opens up new consumers
- Quality management burden is shared with consumers
- Integration with corporate GIS is now much closer