

Efficiency Seminar for School Transportation



TRANSPORTATION \$ SHRINKING ?

Here are some places to Look

Use Optimization to improve Transportation Plan.

Be sure to get reimbursed for PK, Smart Start, etc. that is out of normal route area.

Enforce Idling Policies.

Monitor Drive Time. Minimum Time guarantees paid by local funds

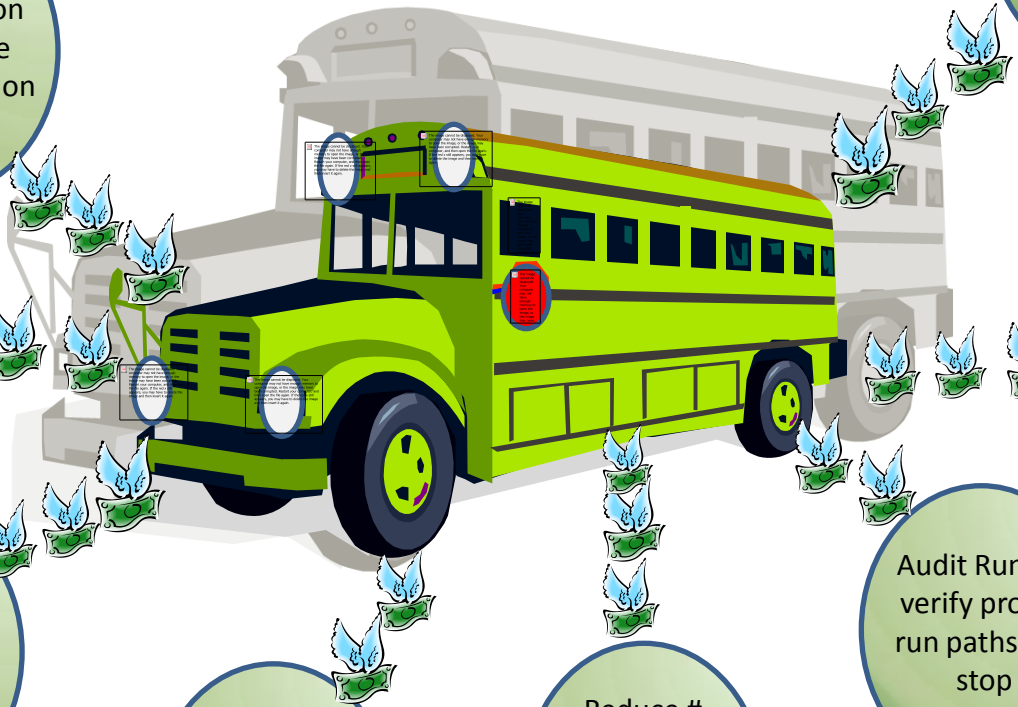
Multi-School
Multi-Grade
Transportation

Staggered Bell Times

Multi-tier Busing

Reduce # Stops –
Increase Stop to Stop Distance

Audit Runs to verify proper run paths and stop locations.



Local Policies

- Bell times, program placement, magnet programs, etc. and how these policies affect the efficient utilization of the transportation fleet.
- If the transportation plans are developed solely from a school-level perspective, opportunities to more efficiently utilize the school bus fleet may be lost.
- TIMS Staff has the experience to advise in these matters.

Rules, Regulations, Guidelines, Policies & Laws

www.ncbussafety.org/NCLaws.html

- **Transportation of students to programs other than to/from school.**
- **Idling Policy**

DPI Office of Financial and Business Services Allotment Policy Manual–Transportation
Pgs 66 & 67

- **Bus Route Creation**
- **Route Paths**
- **Minimum Stop to Stop Distance**

Policies of the NC State Board of Education Regarding Pupil Transportation
SBE Policy #TCS-H-002, 16 NCAC 6B.004

- **Student Ridership Eligibility**

Public School Laws Governing School Transportation
§ 115C-242 (4) & 115C-246 (b)

A journey of a thousand miles begins with a single step.

North Carolina School Bus Safety

ncbussafety.org

North Carolina Department of Public Instruction

[safety](#) [NC resources](#) [vehicles](#) [library](#) [training](#) [mailing lists](#) [archived news](#) [contact](#) [search](#)

HEADLINES

The Clean School Bus



North Carolina Receives Six New School Buses with 2010 Emissions

HIGHLIGHTS

[Training](#) - School Transportation Safety Reports and Forms for North Carolina
[TIMS - School Bus Routing Simulator 2010](#) - Budget Rating Information
[Contracts and Specifications](#)
[Used Vehicles for Sale](#)
[Laws & Policies](#) of North Carolina
[Operation STOP ARM](#) - Illegal Passing
[BSIP - Business Systems Information Portal](#)
[Transportation Manuals](#)
[Transportation Links](#)
[Bus Inspector Certification](#) **NEW!**
[Environmental Health & Grants](#)

NEW TO WEB SITE

[2009-2010 Transportation Funding, Efficiency](#) (June 2009)

SCHOOL BUS SAFETY

PARENTS & CHILDREN
FAQs : [Safety Tips](#) : [Safety](#)

HIGHWAY SAFETY
[Illegal Passing](#) : [STOP ARM](#)

TEACHERS & SCHOOL BUS DRIVERS
[Safety Tips](#) : [Games](#) : [Dr](#)



The Bus Stop
Public Service Announcement
Click [Projector](#) to Play Video
Click [HERE](#) to request a



A journey of a thousand miles begins with a single step.

North Carolina School Bus Safety

ncbussafety.org

North Carolina Department of Public Instruction - Raleigh, North Carolina

Web

[safety](#) [NC resources](#) [vehicles](#) [library](#) [training](#) [mailing lists](#) [archived news](#) [contact](#) [safety center](#) [home](#) [search](#)

NC Laws and Policies

[Public School Laws Governing Pupil Transportation](#)

[Requirement for Transportation to/from At-Risk Programs](#)

[School Bus Drivers - Cell Phone Use Prohibited](#)

[Policies of the NC State Board of Education Regarding Pupil Transportation](#)

[School Attendance and Student Accounting Manual](#)
(Inclement Weather Closing After Buses are Rolling, page 38)

[DPI Office of Financial and Business Services Allotment Policy Manual - Transportation](#)
(Including Idling Reduction Requirements)

[Services by Governmental Units G.S. 66-58 section c\(9b\)](#)
Stipulates allowable use of activity buses by outside groups (non-profits transporting children)

[Law governing sale of tax-free fuel](#)

Other Laws

14-33. [Misdemeanor assaults, batteries, and affrays, simple and aggravated; punishments \(school employees\)](#)

14-132.2. [Willfully trespassing upon, damaging, or impeding the progress of a public school bus.](#)

State TORT CLAIMS ACT



Transportation of Students to Programs OTHER than to/from School

State Board of Education (SBE) policy states that *“...These funds may **NOT** supplant other state, federal and local programs use of the “yellow bus” that serve the instructional purpose of the school, such as **Pre-K, Smart Start, Head Start, etc., Remediation Programs, Summer School, NC State Fair, Special Olympics, NC Symphony and other instructional field trips. When allotted state transportation funds are used for these services for these programs, the responsible program must reimburse this fund.”***

Transportation of Students to Programs OTHER than to/from School

- Transportation of students in these special programs **without reimbursement** is provided **only if the bus does not have to make a deviation to the route established for authorized students and if there is sufficient capacity.**
- Otherwise, transportation for these students must be reimbursed.
- Creating **additional unnecessary runs to increase available capacity is not permitted**, unless the additional non-authorized students' transportation costs are reimbursed.

Transportation of Students to Programs OTHER than to/from School

BENEFITS – If these students are being transported on regular “yellow buses” it is imperative that the transportation department is being reimbursed from the appropriate sources for the additional time and mileage incurred. This will add additional dollars to the transportation budget.

Idling Policy

“In order to be eligible to receive any mid-year transportation allotment resulting from increased fuel prices, an LEA must have a reduced idling policy in place at the beginning of the school year.”

While all districts should have the idling policy in place, is it being enforced within your LEA?

BENEFITS – Reduced Idling results in reduced fuel consumption, therefore, reduced fuel costs. A side benefit is reduced pollution.

(a) Bus Route Creation

- ***“Superintendents shall plan bus routes in a way designed to conserve fuel and to use buses efficiently.”***
- This policy outlines that it is a district level responsibility for creating school bus routes. The intent is to have a more global solution to the efficient utilization of the school bus fleet for all students and schools in the district.

Bus Route Creation Using TIMS

TIMS provides the ability to analyze alternate scenarios including multi-school transportation or multi-tier transportation through the use of staggered bell times and the simulation of routing impacts on proposed program implementation and/or placement.

Simulation shows actual student impact

- Overall mileage

- Ride times

- Early/Late pickup

(b) Route Paths

“A route may not deviate from a general path of direction for a distance of less than one-half mile and then return to the original path except for groups of 10 or more pupils, unescorted pupils in grades K-3 or special education pupils.”

Additional time, mileage, and costs are required to provide ‘door-to-door’ service for students that are otherwise able to walk a short distance to a bus stop.

Exception: SAFETY

Route Paths

Often it is not possible to avoid entering subdivisions, but proper placement of 'area' stops can reduce the amount of starting and stopping that occurs and may also reduce the amount of travel required within these areas.

BENEFITS –

Reduced Mileage (fuel and salaries)

Reduced Student Ride Time

(c) Minimum Stop to Stop Distance

“Unless safety factors require otherwise, superintendents may not plan bus stops closer together than 0.2 miles. Each student must be at the designated stop at the time of the bus's arrival.”

Starting and stopping a bus in distances this close together is inefficient not only in fuel consumption but also in time.

Exception: SAFETY

Minimum Stop to Stop Distance

- TIMS has the ability to calculate stop-to-stop distances
- Where excessive stops are present, a review should be done to determine if the stops are valid for safety reasons
- If conditions permit, stops should be combined and/or centralized to reduce the waste.
- Exception: SAFETY

TIMS Overview

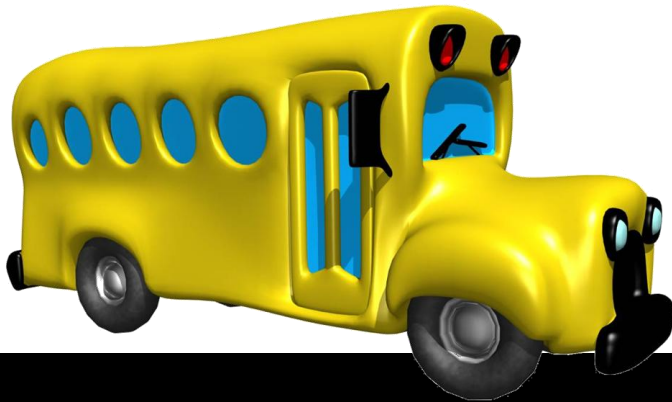
Geocode (street map)

Students, Stops, Runs and Routes

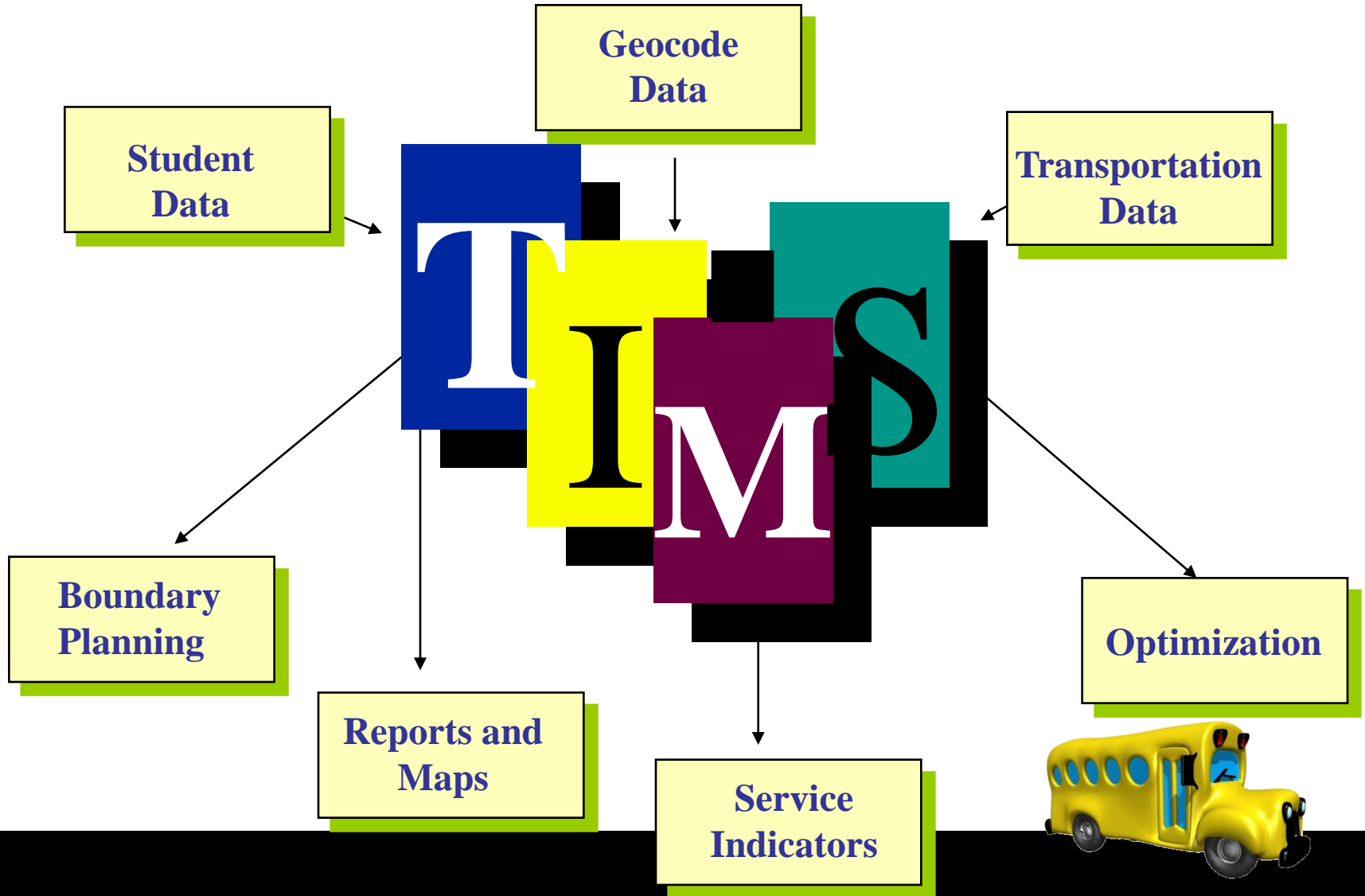
Reports

Optimization

Boundary Planning



The TIMS System



The TIMS System

- Fulfills Legislative Mandate
- Efficiency Improvements
- Safety Enhancements
 - Documents Railroads and other Hazards
 - Documents Students Ridership Information
- Contingency plans
 - Snow routes
 - Emergency evacuation – rapid creation
- Boundary Planning



The TIMS Map (geocode)

- The Geocode is the computerized map of your district's street network. It is the foundation of the transportation and boundary planning system.
- Street attributes such as speed and direction are set in MARIS and they determine the optimal path for the bus to travel.



The TIMS Map (geocode)

- TIMS provides graphical views for transportation planning.

The screenshot displays the Edulog software interface, which is used for transportation planning. The main window shows a map titled "fall_EDULOG.wsp" with a network of roads and various markers. A prominent cyan route with arrows is overlaid on the map, indicating a specific path. The route starts from the bottom left, moves north, then east, then south, and finally west, ending at a pink arrow marker. The map includes several numbered markers (e.g., 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25) and a scale bar indicating 1/4 mile.

On the left side, there is a panel titled "Edit Run Directions" with the following details:

- Current Run Info:**
 - Run ID: 302 011
 - Day Pattern: MTWUF--
 - Update Run Times
 - Generate Report...
- Description:** AG COX RUN 431
- Frequency:** MTWUF-----0
- Max Load:** 80
- Max Time:** 180 min.

The "Run Directions" list includes the following entries:

- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on MAIN ST 28590
- Proceed on E MAIN ST
- Proceed on F MAIN ST

At the bottom of the dialog box, there are buttons for "Edit Stop Times...", "Auto Generate", "Add", "Delete", "Delete Existing Directions", "Auto generate for all day patterns", "OK + Next", "Cancel + Next", "OK", and "Cancel".

The TIMS Map (geocode)

On-line Demo



Map Calibration

- In the Geocode, determining and setting realistic speeds that a bus can travel on each street and making sure the street directions are correct is called Map Calibration.
- Map Calibration is critical in making sure your runs generate correctly and accurately in TIMS.
- If your map is not calibrated correctly, TIMS may not generate runs accurately or reflect accurate stop times.



TIMS Data Inputs

- Student data comes from NCWISE.
- TIMS uses the Geocode to verify student address information.
- Student Transportation Requests come from the schools or parents so the transportation department can design and optimize routes based on this ridership data.



The Importance of Accurate TIMS Data

- Without an accurate list of students who have requested transportation from each school TIMS Data Managers are unable to determine the number of buses needed to meet these demands nor are they able to estimate the driving time required to transport these students.
- We are only as good as the information we receive from:
 - Parents
 - Schools
 - Drivers
- Ridership should be analyzed at the school level to ensure enough buses are in place to provide service



Students

- TIMS contains a record of all students in each LEA. These records are loaded into TIMS by a process called an UPSTU.
- A build from NCWISE is obtained and uploaded into TIMS. The accuracy of student addresses in NCWISE is vital to insure that students are 'located' correctly in the Geocode in TIMS.



Locating Students

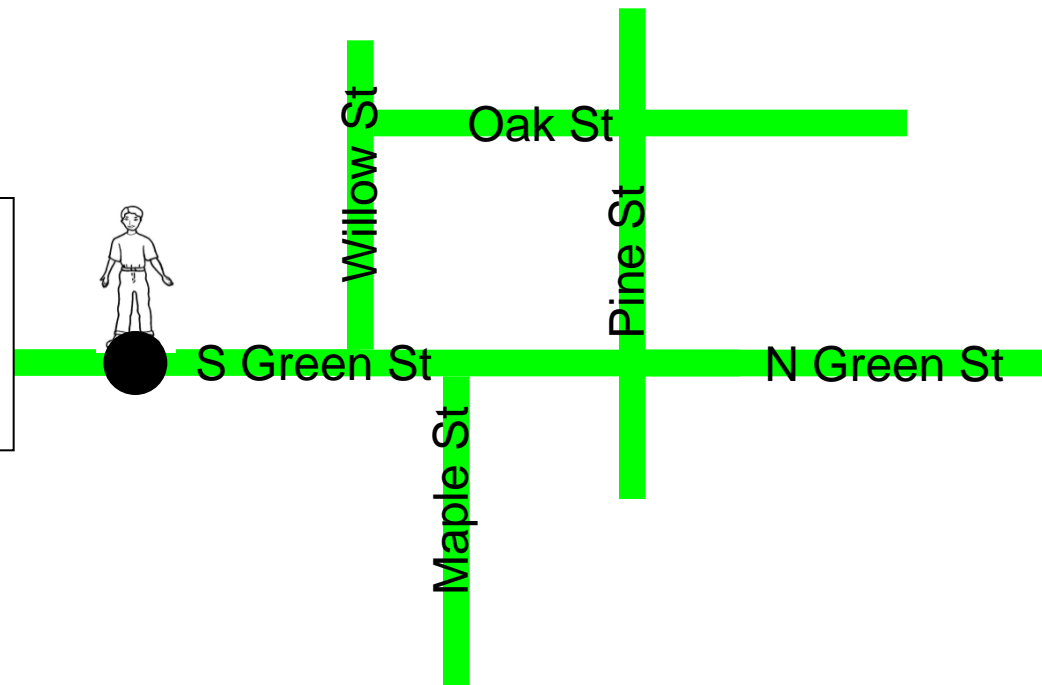
NCWISE address

505 S Green Street

TIMS address

Num	Pr	Street Name	Type	Suf
505	S	Green	St	

The system matched the NCWISE address to an address in the Geocode, therefore this student is 'located'.



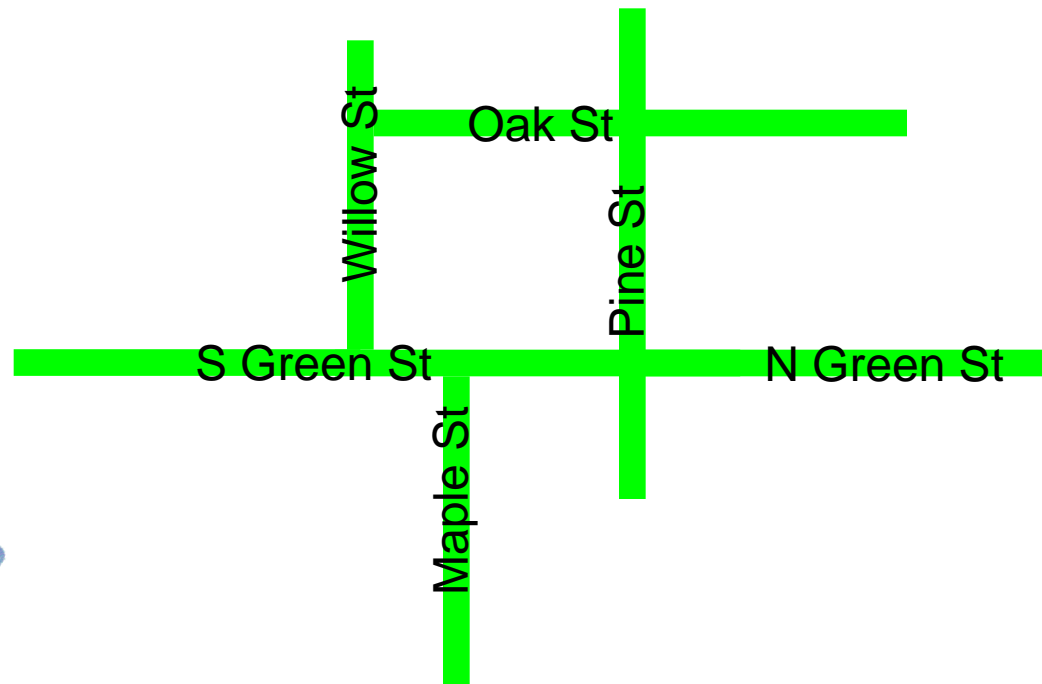
Locating Students

NCWISE address

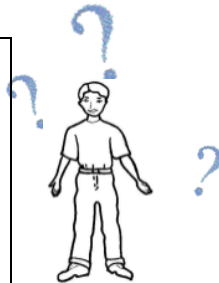
505 S Greene Street

TIMS address

Num	Pr	Street Name	Type	Suf
505	S	Greene	St	



The geocode does not have a Greene St.; so it doesn't know where to 'locate' this student.



Student Screens in TIMS (demo)

Student data entry form

Last Name: DOE School: 302 District ID: 000000123456 Elg: 0 U: 99
 First Name: JOHN Grade: 06 Edulog ID: 3 Goto:
 Date of Birth: 01/01/1997 Program: Sch. Distance: 1.16 mi Copy Fields

Location: 447 CHANNEL DR Home Stop Home Stop
 Res Addr: 447 CHANNEL DR Copy Special Needs Special Ed
 Special Needs Other Needs

AM Transport Location AM Shuttle
 PM Transport Location Copy PM Shuttle

Other Fields: Att Endry Trips Picture Print School Path Quick Assign

Confirm Cancel Delete Previous Next Walk Path Discipline

I...	P/U Location	Stop Description	Run
1	=HOME	CHANNEL DR & WEDGEWOOD CI	MT\
2	=SCHOOL - 302	CHANNEL DR & WEDGEWOOD CI	MT\

AM Trn D > AM Trn T >
 PM Trn D > PM Trn T >

Race: 1 City Code: 565
 City: MAYBERRY Sex: R
 Zip Code: 12345 Home Ph: 515-5555

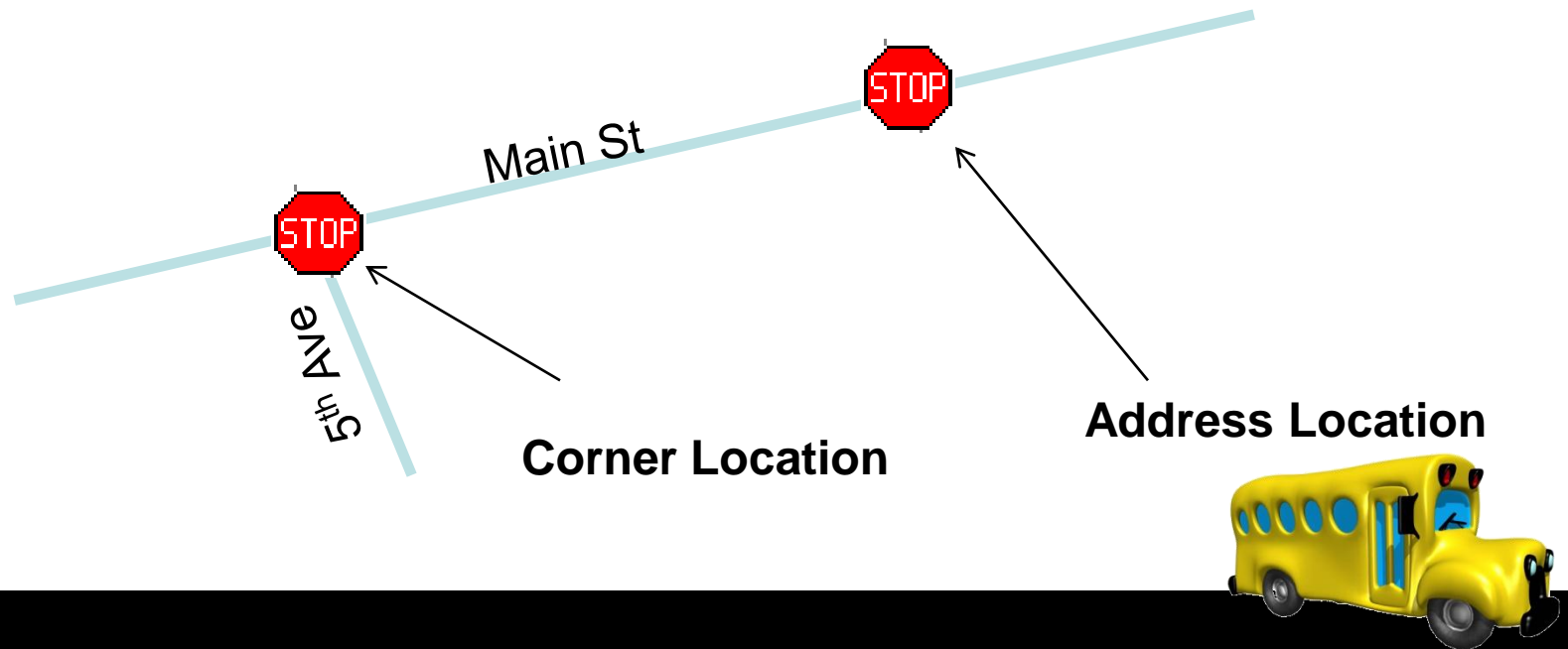
Date modified: 08-20-2010 Date created: 08-20-2010

Confirm	CmnDst	Previous	Next	Spcl Needs	Eligibility	Parent Info	CANCEL
Last Name: DOE	Edulog ID: 3	Curr	Home	Next	ADMIT Date:		
First Name: JOHN	District ID: 000000123456	School: 302			REGIS Date:		
Mid Name:	Home Ph:	Grade: 06			FRM:		
Counselor:	Race: 1 Sex: R	Program:			HR:		
	Yr Rnd:	Tren Ex:					
Location: 447 CHANNEL DR	City:	Elg Code:	0				
Residence: 447 CHANNEL DR	State:	Zip Code:			User ElgCde:	99	
Mail Add:							-SPECIAL NEEDS-
Apt#:	Nd1: 4995 Nd2: 4966 X: 2478589 Y: 653142				EC Code:		
AM Trn T >	AM Trn D >	AM Bus D >	OD-Bndy	Local1	Local3		Loading: <input type="checkbox"/>
PM Trn T >	PM Trn D >	PM Bus D >	OD-Chty	Local2	Local4		Restraint: <input type="checkbox"/>
							Monitor: <input type="checkbox"/>
Father: JOHN DOE SR	Res: 515-5555	Work: 515-4444	Cell:				
Mother: JANE DOE	Res: 515-5555	Work: 515-3333	Cell:				
Emerg1: SARA JONES	Emerg1 Ph: 515-4545						
Emerg2: BOB SMITH	Emerg2 Ph: 515-6767						



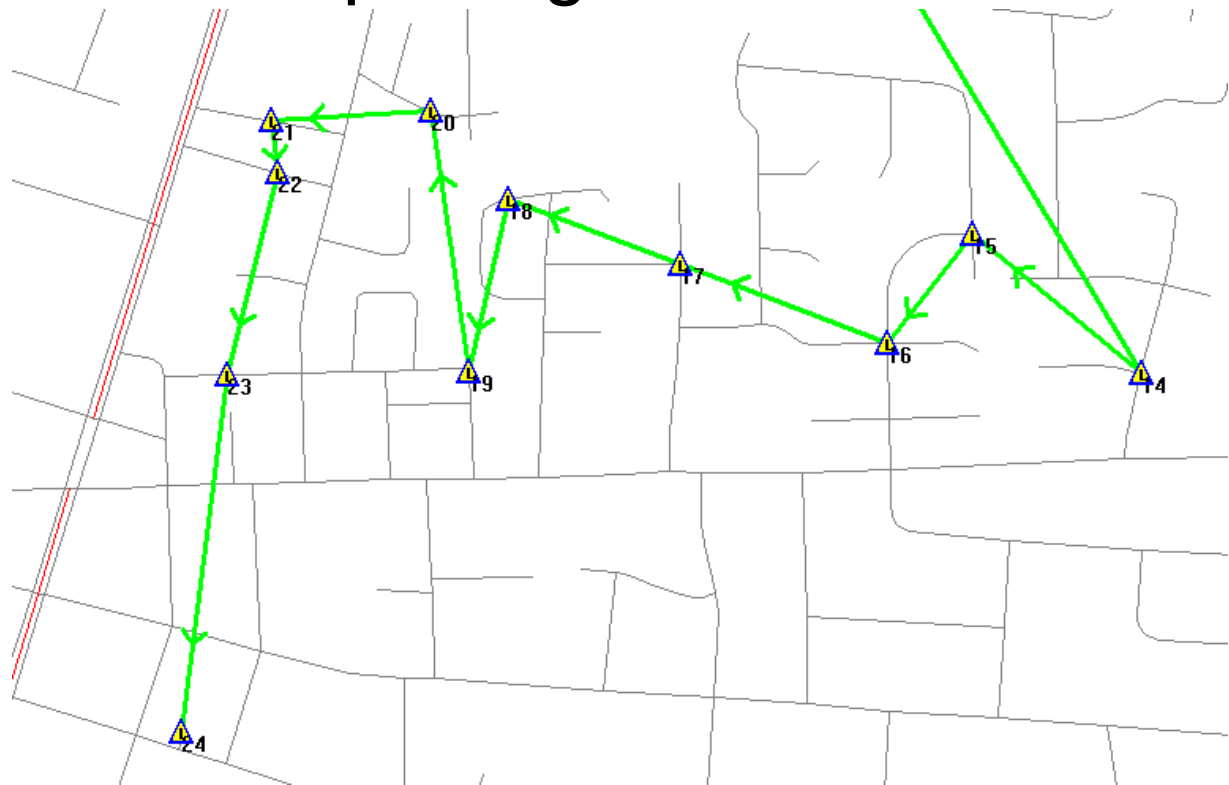
Stops (demo)

- A stop is any location in the geocode where students are picked up or dropped off from school.
- Stops can be located at a specific address or at a corner.



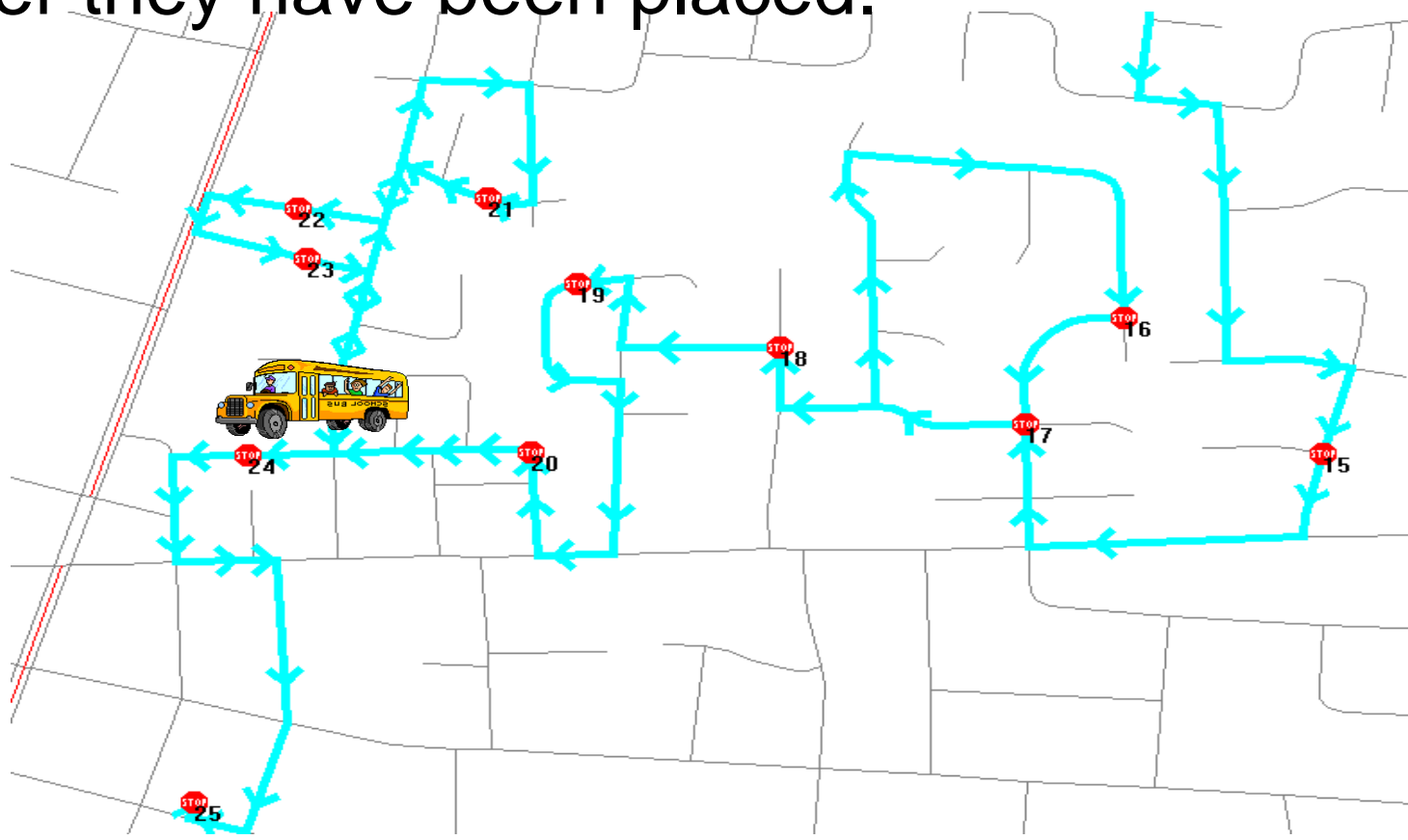
Runs

- A run is a sequence of stops that a bus makes when transporting students to or from school.



Run Directions (demo)

- Once a map is calibrated correctly, TIMS will find the quickest path between each stop in the order they have been placed.



School Bell Times

SCHOOL INFORMATION BY GRADE AND PROGRAM

Edit Copy Prog Save Program Confirm Cancel Days

School 302 Program [dropdown] Days of Week MTWUF----- [dropdown]

Grade	Bell Times	Bus		Depart
		Early	Late	
05	08:00 AM	07:30 AM	07:50 AM	
	03:00 PM	03:05 PM	03:30 PM	
06	08:00 AM	07:30 AM	07:50 AM	
	03:00 PM	03:05 PM	03:30 PM	
07	08:00 AM	07:30 AM	07:50 AM	
	03:00 PM	03:05 PM	03:30 PM	
08	08:00 AM	07:30 AM	07:50 AM	
	03:00 PM	03:05 PM	03:30 PM	

- Student Transportation is based upon:
 - Bell Times & Windows
 - Bus Early
 - Bus Late
- These allow staff to schedule buses for drop-off or pick-up at a school within an established timeframe.

–Small windows do not permit double runs from the same school

–Larger windows require school supervision for students who have been dropped off early (AM) or are waiting on a bus to return for a second load (PM)



Reports

- Multiple pre-set reports are available in TIMS
- With TIMS we have the ability to customize reports to show exactly the data you need.
- Runs with stops and student names
- Reports on geographical information (street names and attributes)
- Runs with driver directions
- Summaries of Route Time and Miles
- Passenger Lists
- Stop Locations



Route Directions with Run, Stop, and Student Info

Route ID: 370 **Bus Number:** 370 **Vehicle Capacity:** 0
Route Description: WG/AGC 370

Stop Time & Description	Student Address	Acc Miles
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RunID: WPI.001

Run Description: WPI RUN 370

6:29 AM 0 WINTERGREEN DR		0.0000
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Proceed on WINTERGREEN DR
Turn Right on WINTERGREEN DR
Turn Left on COUNTY HOME RD
Turn Left on OLD FIRE TOWER RD
Proceed on COUNTY HOME RD
Proceed on E ARLINGTON BV
Turn Left on W ARLINGTON BV
Proceed on W ARLINGTON BV
***RR XING* 904553V**
Turn Left on BEASLEY DR
Turn Right on BEASLEY DR

6:44 AM 1406 BEASLEY DR		6.6254
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XTT, MOHAMED	353 BEASLEY DRIVE	406	01
XLL, SPENCER	355 BEASLEY DRIVE	406	01
XOO, SHANESE	355 BEASLEY DRIVE	406	01
XOO, ESLAM	411 BEASLEY DR	404	04
XHH, THURMAN	355 BEASLEY DRIVE	404	03
XYY, DASHAUN	350 BEASLEY DR	406	02
XRE, DANASIA	350 BEASLEY DR	404	04

Summary of Route Time and Miles

Route Time and Miles

Summary for Review

2008-2009

Mileage		Time In hours	
		Negative slack is not included in total.	
Loaded	7763.88	Loaded + Checkpoint	471.4
Deadhead	484.33	Deadhead	24.0
Checkpoint	3001.90	Slack	57.7
		Negative Slack	-10.5
Total	11250.12	Total	553.1



Passenger Lists

- A list of students assigned to a particular stop or all students on a bus.
 - Useful for updating routes
 - Keep on buses for emergency information

Passenger Lists by Run

Run ID: WPI.001

Description: WPI RUN 370

Last name, First name	Address	Home Phone #	School	Grade
ABC, KAMREN	915 ALLEN RD	5154433222	406	01
AXS, HEAVEN	915 ALLEN ROAD	1112226666	406	01
BER, DEVONRICK	919 ALLEN RD	2223334444	404	05
CCV, JASON	960 SPRING FOREST ROAD	5556667777	406	01
CLL, TYHEIM	510 SPRING FOREST RD	0009990000	404	03
DAG, RAEGENE	940 SPRING FOREST ROAD	0009990000	406	01
DEF, TINYA	510 SPRING FOREST RD	1231234567	404	04
DLL, TIFFANY	913 ALLEN ROAD	3332227777	406	02
EEH, UZZIAH	520 SPRING FOREST ROAD	4445554444	406	01
EJO, DUVAN	870 SPRING FOREST RD	5556663333	404	03
ERB, VICTOR-GABRIEL	524 SPRING FOREST ROAD	4443334444	406	01
ERE, NAZARIA	890 SPRING FOREST ROAD	5556665555	406	01
ESD, TYKERA	520 SPRING FOREST RD	4445556666	406	01

NCDOT Railroad Crossing Report

Stop Time & Description	Student Address	Acc Miles
RunID: 366.003		
Run Description: JHR RUN 111		
8:14 AM W 4TH ST GR & VANCE ST		2.7451
CANDY, SUMMER	500 CONTENTNEA ST	366 12
REDS, LIGHT	412 VANCE ST	366 12
Turn Right on W 4TH ST		
8:14 AM ELIZABETH ST & W 4TH ST GR		2.8922
PARKER, MITCH	304 ELIZABETH STREET	366 10
SMITH, JOHN	1007 W 4TH ST	366 11
HARPER, BOB	402 LATHAM ST	366 09
WALL, MARK	400 LATHAM STREET	366 10
Proceed on W 4TH ST		
DBL XING NO DOT		
8:15 AM 1000 W 4TH ST		3.0439
PREZZ, TWAIN	1300 ANGELS END	366 10
Proceed on W 4TH ST		
Turn Right on S PITT ST		
Turn Right on W 5TH ST		
8:15 AM 416 MARTIN LUTHER KING JR DR		3.2396
SMTIH, RUDY	108 S SUMMIT ST	366 11
PAGE, ZACH	419 W. 5TH ST	366 09
SHARP, BOBBY	415 W. 5TH STREET	366 09
CARR, ERICA	415 W. 5TH STREET	366 09
PITT, CHARLES	415 W 5TH ST	366 10
Proceed on W 5TH ST		
RR XING 641609H		
Turn Left on ALBEMARLE AV		

Warning of Double Crossing



RR Crossing Warning



TIMS Operators have the option of including Railroad Warnings in their printed driving directions.

As part of the TDTIMS Annual Audit, each LEA runs a Railroad Crossing Report that tallies the number of times a bus goes over each crossing and the number of students on the bus.

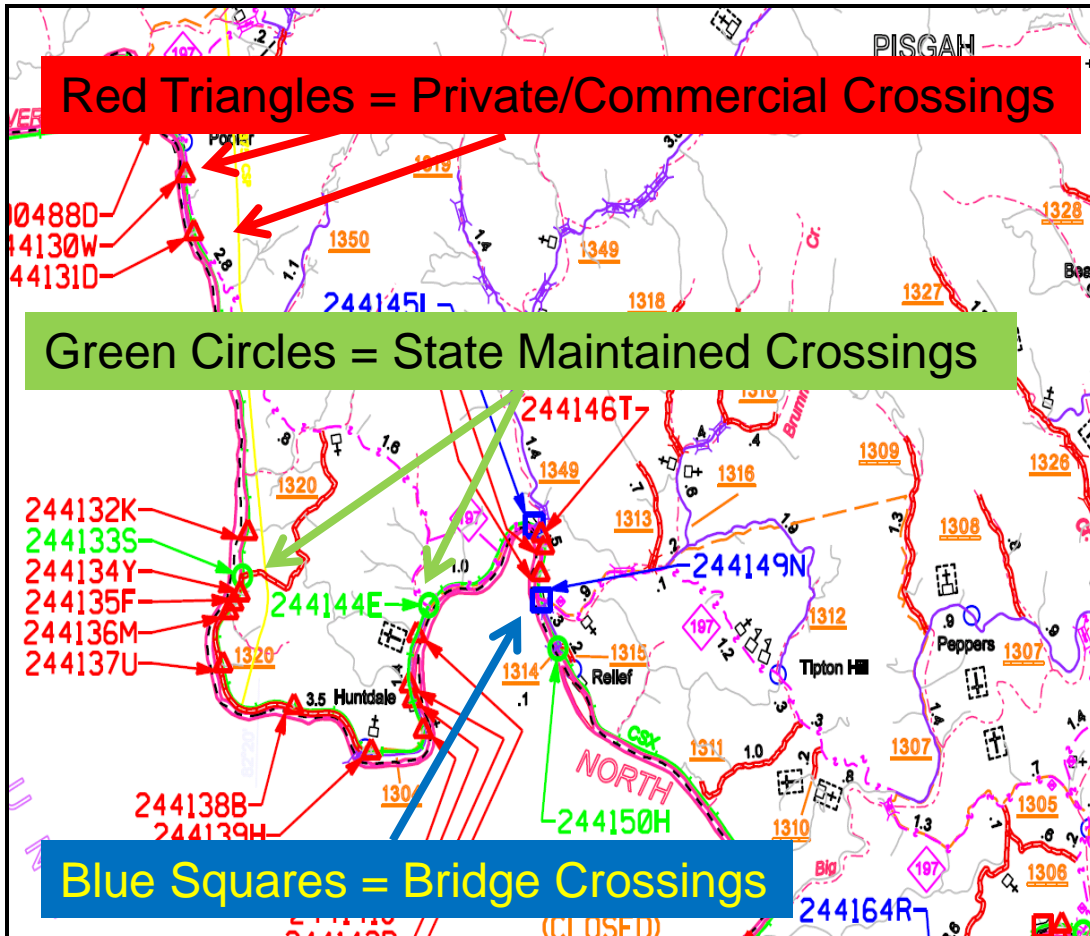
This data is transmitted to NCDOT who uses the information in prioritizing railroad crossing inspections and upgrades.

NCDOT Railroad Crossing Report

- The Rail Division of NCDOT can provide you with PDF Map Images of your Railroad Network.
- Types of Crossings
 - State Maintained Crossings (Public)
 - Private/Commercial Crossings
 - Overpass & Underpass (Bridge) Crossings
- In addition to the Railroad Network and Types of Crossings, the map image also displays the State Identification Number for each crossing.



NCDOT Railroad Crossing Report



- Railroads are added to your districts Geocode using MARIS.
- Correct placement of railroad crossings are important as railroad warnings can be placed within driver directions generated from TIMS and can alert the driver to an upcoming stop.



Run Optimization

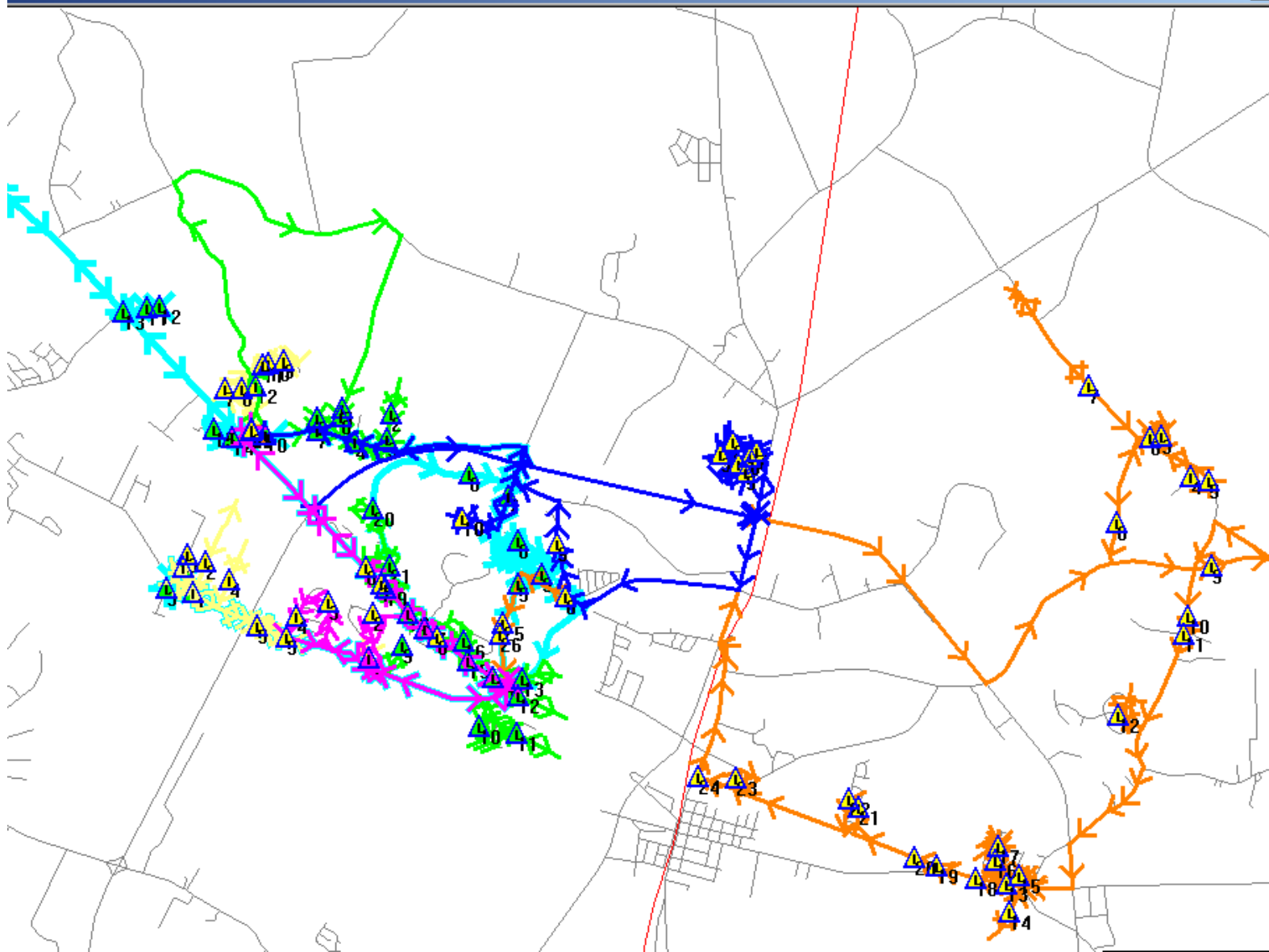
- Run Optimization takes a group of bus stops and creates a new set of runs that meet the needs of your LEA.
- This usually involves picking up the most students with the fewest number of buses in the least amount of time.
- The three factors involved are:
 - Bus capacity
 - Total miles
 - Run time



6 RUNS

Total students/Beginning run time

- 38/6:26
- 27/6:12
- 50/6:38
- 36/6:16
- 16/6:42
- 23/6:56



Run Optimization

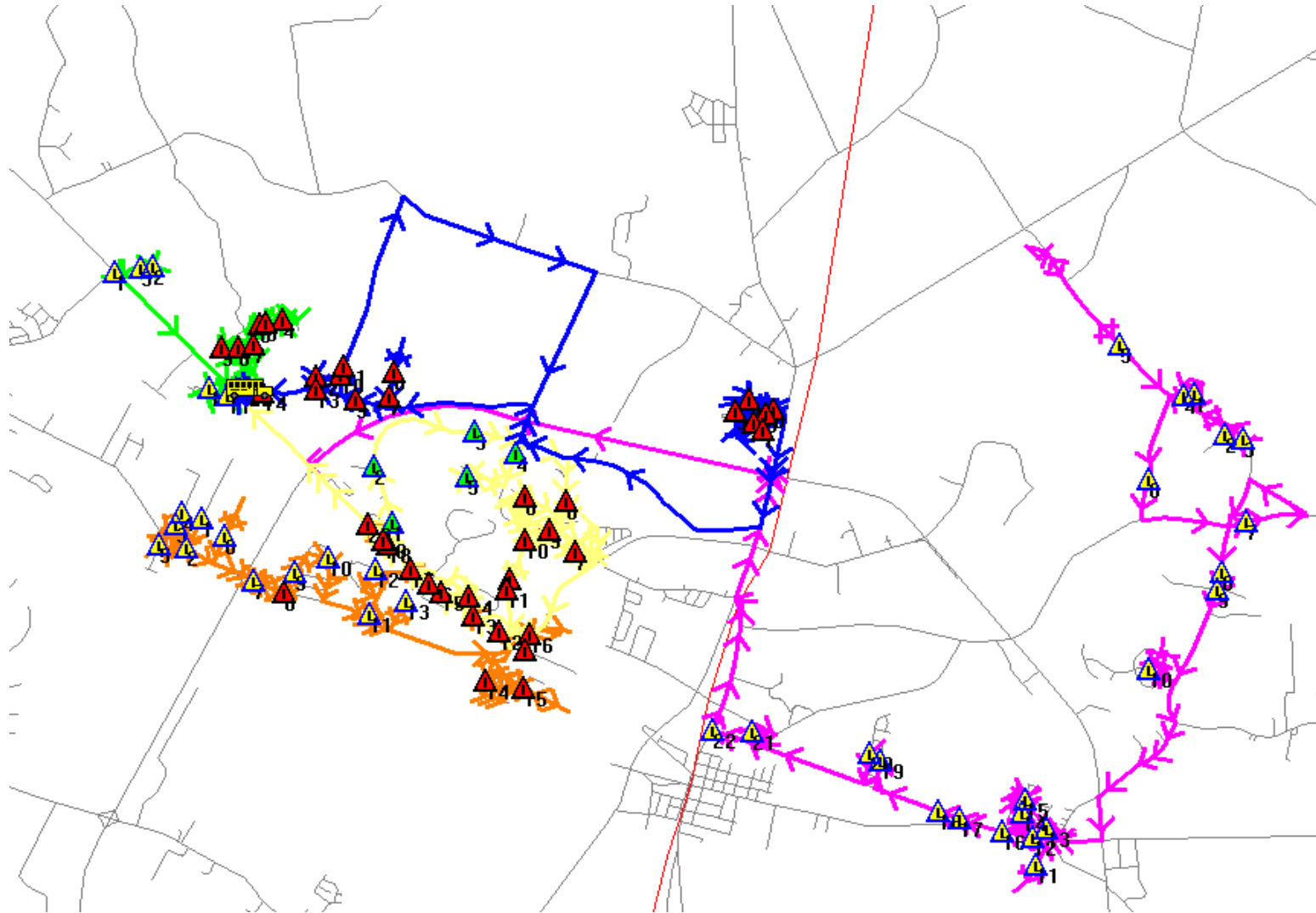
5 basic steps to run optimization

- Load the data and define the optimization problem
- Use the optimization functions to create a set of optimized runs.
- Evaluate the results
- Make manual adjustments as necessary
- Confirm and save the runs

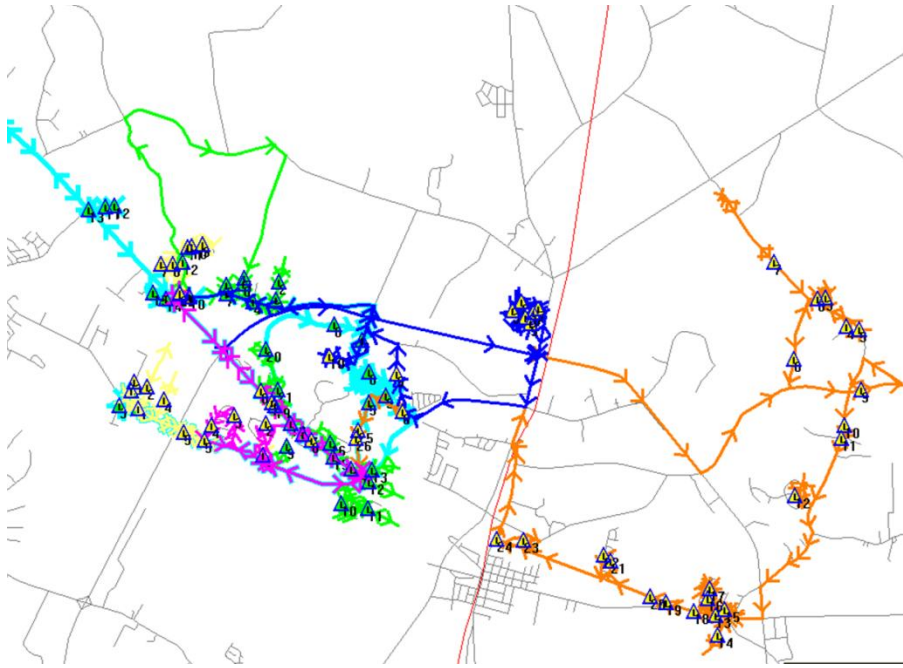


- 5 RUNS
- Total students/Beginning run time

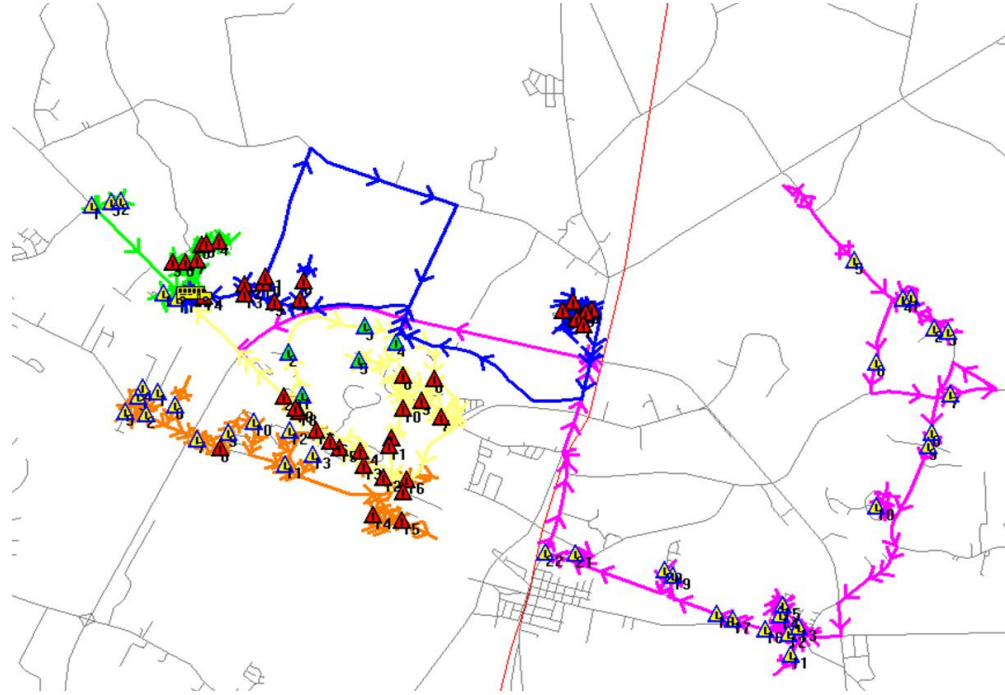
- 27/6:41
- 51/6:50
- 43/6:43
- 53/7:08
- 16/6:47



6 Runs



5 Runs



(demo)

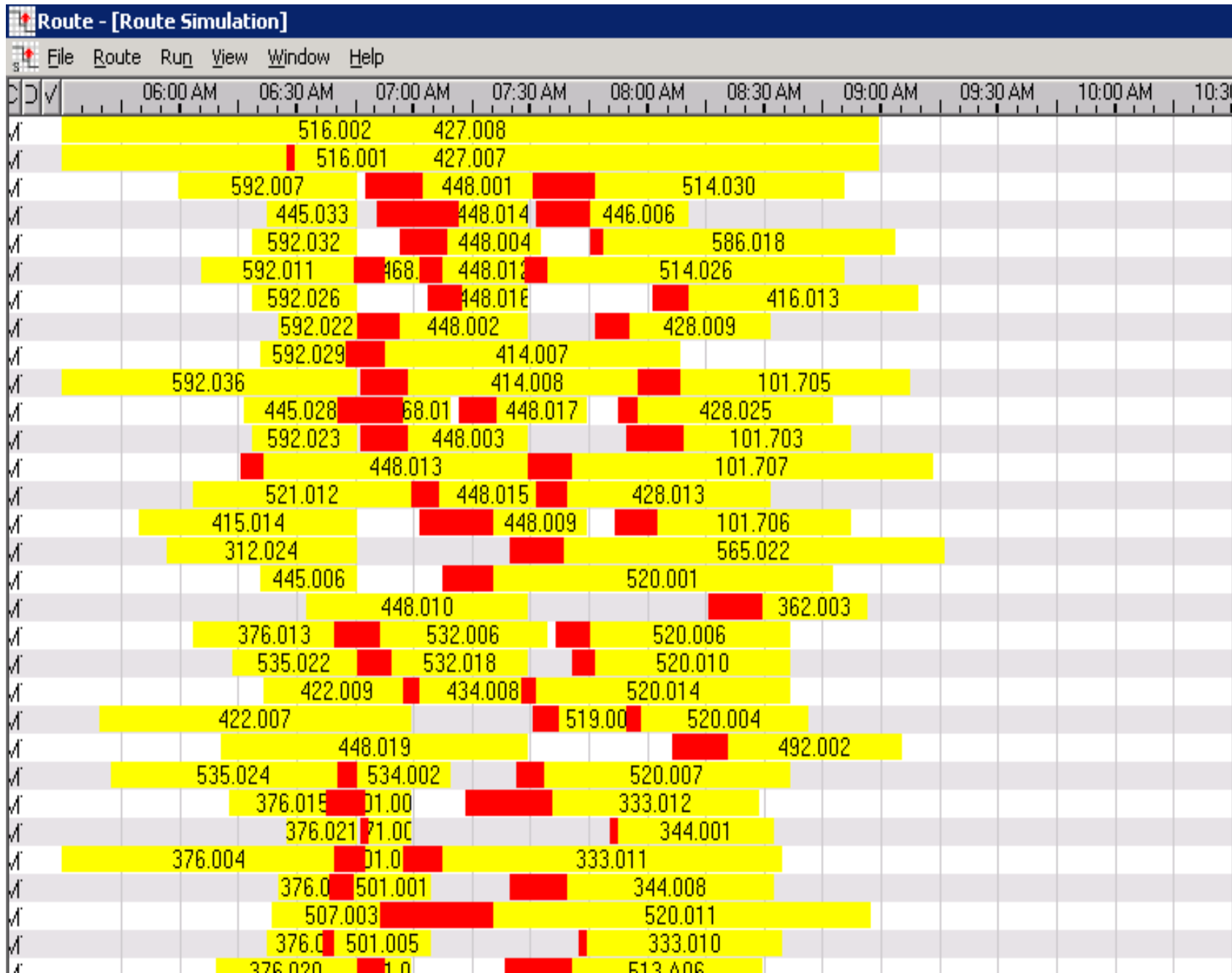
Route Optimization

Similar features as found in run optimization

- Load bus runs by list or all runs
- Utilize the powerful feature of defining variances in bell times (5 or 10 minutes one way or the other) on specific runs or all runs to suggest pairings of bus runs
- Once parameters are defined, the system optimization functions will create a set of optimized routes.
- Evaluate the results
- A route timeline is produced (next slide) showing results:
 - 1608 runs were brought into route optimization producing 279 routes; averaging 5 runs per route am/pm



Route Optimization



Plotting and Boundary Planning

- The Plotting feature in TIMS allows you to perform a variety of tasks, such as producing plots of students and bus runs.
- Boundary Planning allows you to create, modify or use existing boundaries to tally students by a wide variety of information such as school code, grade and gender.



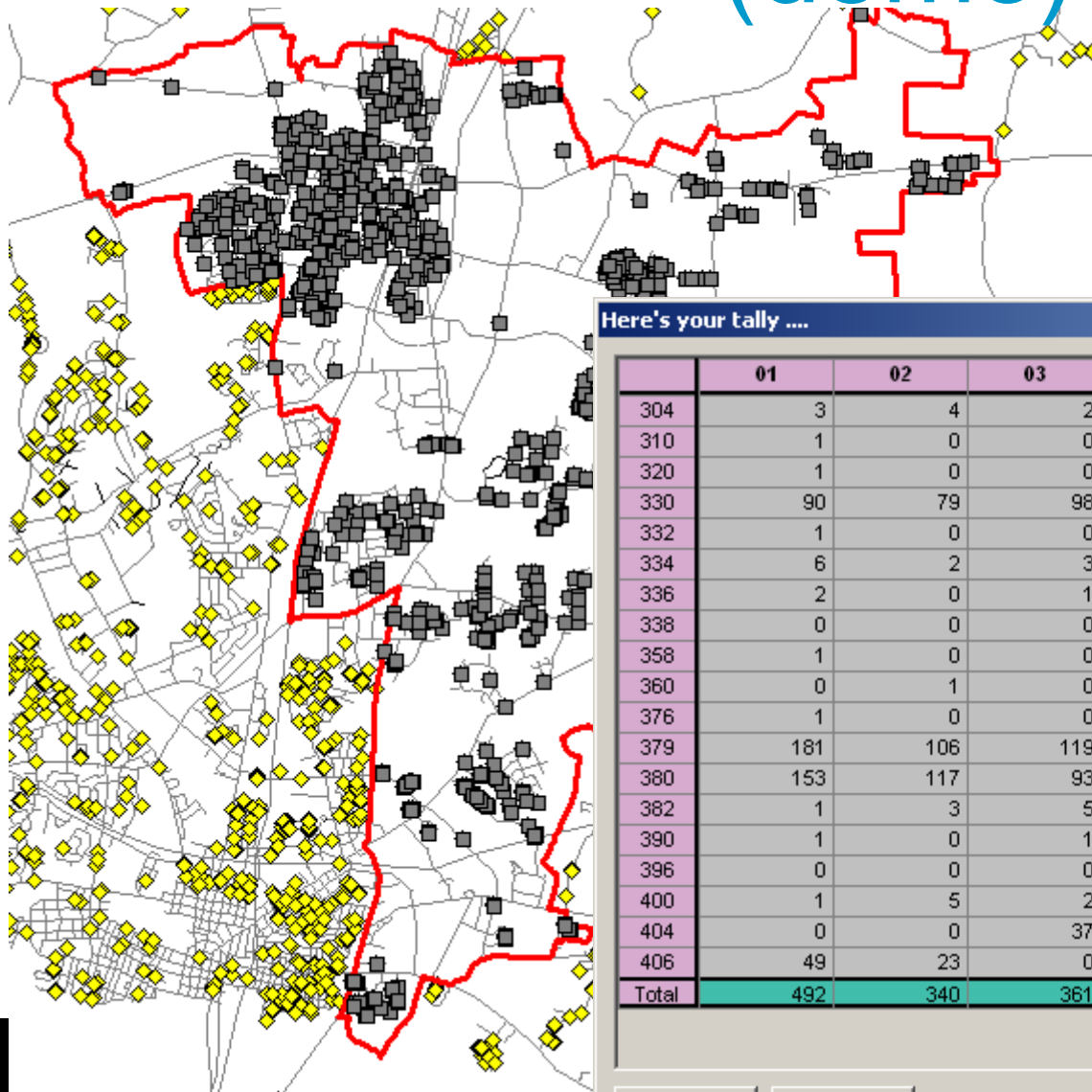
Redistricting – Boundary Planning

- Boundary Planning is widely used when districts begin the redistricting process because of the ability to create and edit boundaries and tally the students inside those boundaries.
- Moving boundary lines and obtaining those tally's quickly is invaluable in the redistricting process.



Boundary Planning – Tally

(demo)



Here's your tally ...

	01	02	03	04	05	Total
304	3	4	2	2	1	12
310	1	0	0	1	1	3
320	1	0	0	0	0	1
330	90	79	98	88	71	426
332	1	0	0	2	0	3
334	6	2	3	2	0	13
336	2	0	1	1	1	5
338	0	0	0	1	2	3
358	1	0	0	0	0	1
360	0	1	0	0	0	1
376	1	0	0	0	0	1
379	181	106	119	104	109	619
380	153	117	93	118	105	586
382	1	3	5	5	3	17
390	1	0	1	1	1	4
396	0	0	0	1	0	1
400	1	5	2	1	0	9
404	0	0	37	34	26	97
406	49	23	0	0	0	72
Total	492	340	361	361	320	1874

Tally view
Down the side
FIRSTNAME
GRADE
LAST NAME
RACE
RES ADDR
SCHOOL
CEV

Along the top
FIRSTNAME
GRADE
LAST NAME
RACE
RES ADDR
SCHOOL
CEV

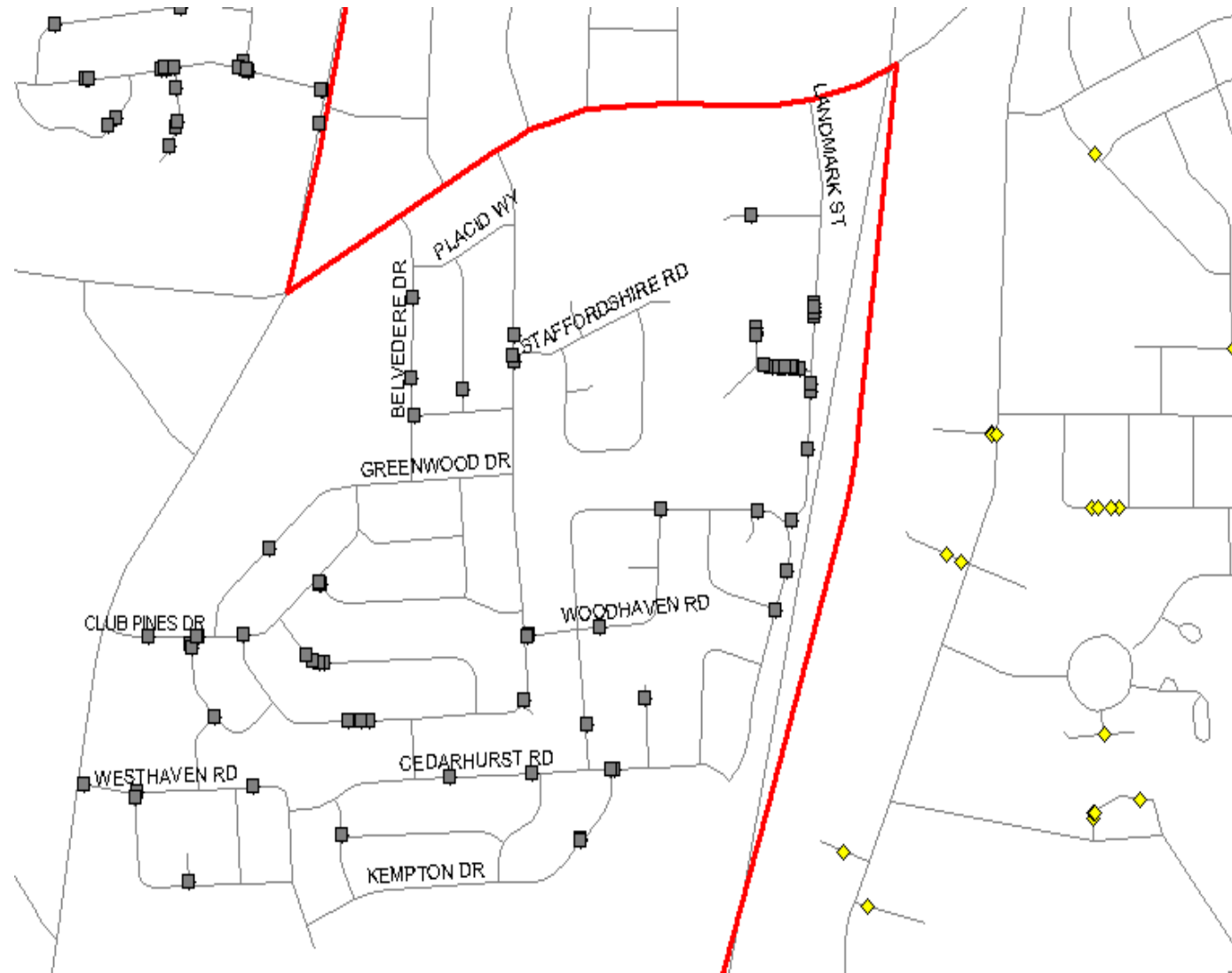
Switch side and top

Show %'s
 Show Totals

Colors...

Print Export Close

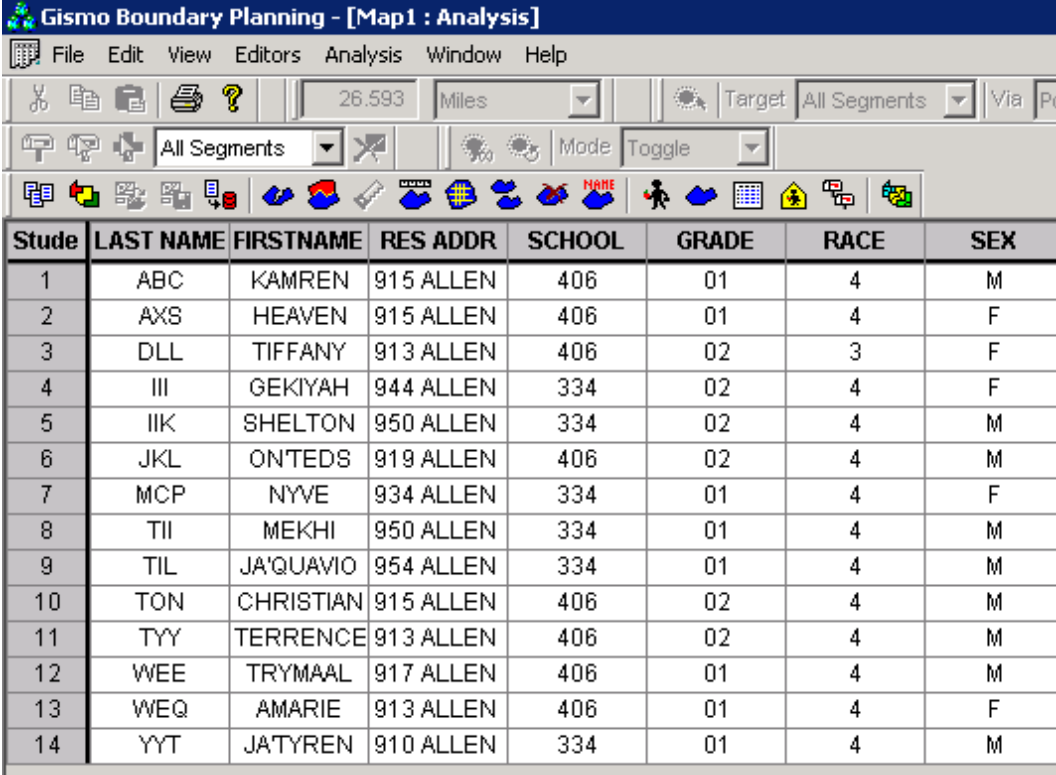
Boundary Planning - Tally



- View of student locations; the grey icons indicate the students that were included in the tally.

Boundary Analysis

- In this example, we tallied students in 'Boundary A' that were in the 1st and 2nd grade. This data is presented in spreadsheet form, and can be exported to Excel.

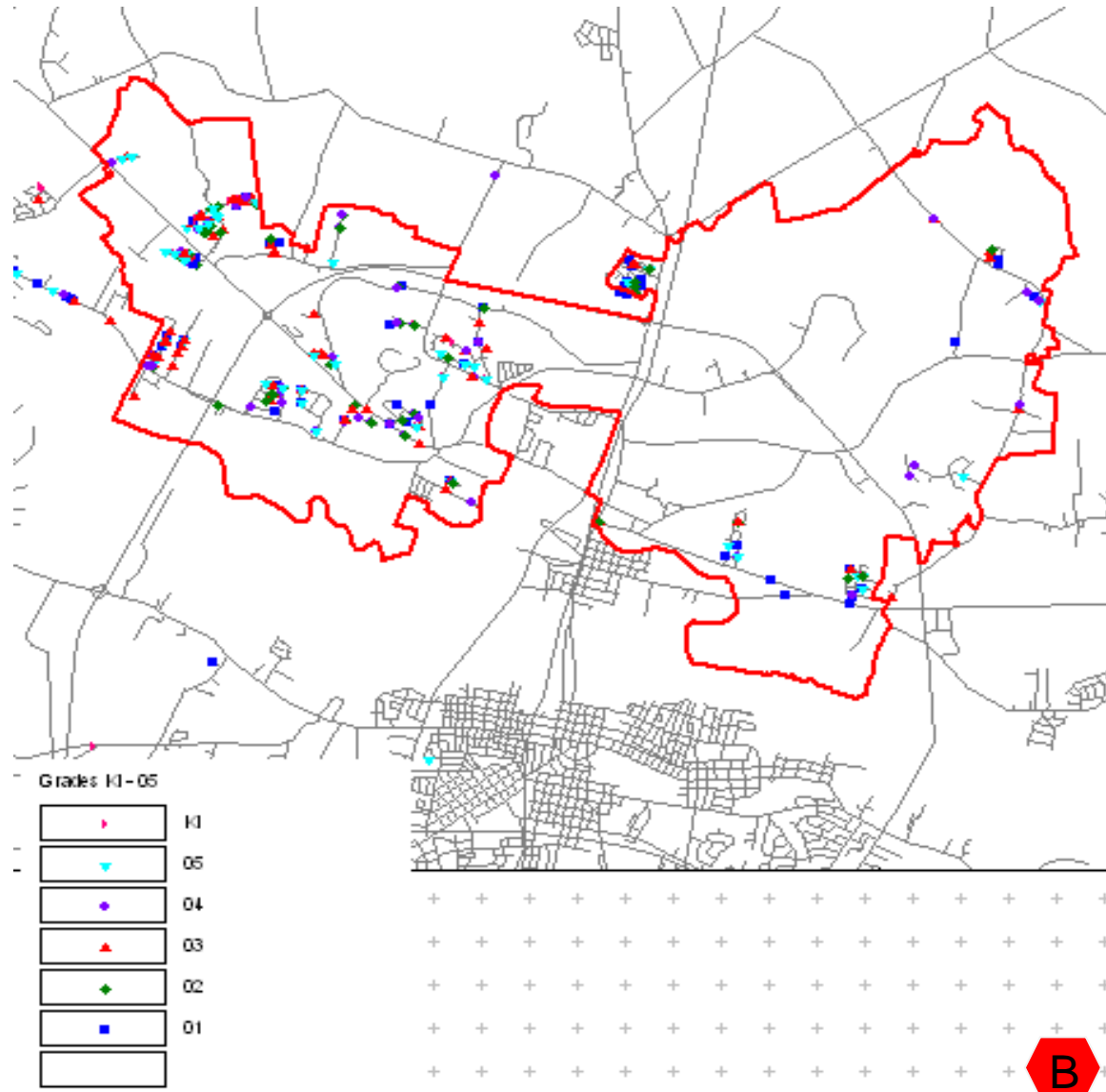


The screenshot shows the Gismo Boundary Planning software interface. The title bar reads "Gismo Boundary Planning - [Map1 : Analysis]". The menu bar includes File, Edit, View, Editors, Analysis, Window, and Help. The toolbar contains various icons for file operations and analysis. The main window displays a data table with the following columns: Stude, LAST NAME, FIRSTNAME, RES ADDR, SCHOOL, GRADE, RACE, and SEX. The table contains 14 rows of student data.

Stude	LAST NAME	FIRSTNAME	RES ADDR	SCHOOL	GRADE	RACE	SEX
1	ABC	KAMREN	915 ALLEN	406	01	4	M
2	AXS	HEAVEN	915 ALLEN	406	01	4	F
3	DLL	TIFFANY	913 ALLEN	406	02	3	F
4	III	GEKIYAH	944 ALLEN	334	02	4	F
5	IIK	SHELTON	950 ALLEN	334	02	4	M
6	JKL	ONTEDS	919 ALLEN	406	02	4	M
7	MCP	NYVE	934 ALLEN	334	01	4	F
8	TII	MEKHI	950 ALLEN	334	01	4	M
9	TIL	JA'QUAVIO	954 ALLEN	334	01	4	M
10	TON	CHRISTIAN	915 ALLEN	406	02	4	M
11	TYY	TERRENCE	913 ALLEN	406	02	4	M
12	WEE	TRYMAAL	917 ALLEN	406	01	4	M
13	WEQ	AMARIE	913 ALLEN	406	01	4	F
14	YYT	JATYREN	910 ALLEN	334	01	4	M

Boundary Analysis

- By displaying student locations you are able to identify high density areas as well as students who live outside of established boundaries.



Using TIMS for Efficiency



Using TIMS for Efficiency

Who makes your routing decisions?

- How are your routing decisions made?
 - Stop Placements
 - Stop Order
 - Student Assignments
 - # of Runs per School
 - Sharing buses among schools
- Are they made by...
 - School(s)?
 - Transportation Office?
 - Board of Education?



Development of the Transportation Plan

- The transportation plan should be developed and guided by LEA personnel that have the best tools and broadest view of the entire transportation system
- When a plan is developed at the school level, consideration is often given only to a narrow set of circumstances. However, school level supervision and input that is vital to an overall efficiently run transportation plan.
- The LEA Administration, school administrators and the Transportation Department should form a cooperative team that provides and implements a well-developed transportation plan.



Routing Decisions

How involved is the Transportation Department?

- Who is looking at the big picture?
 - Is transportation considered when placing EC students, special programs or magnet locations?
 - Is routing reviewed prior to the start of each year?
 - Who sets the bell times for each school?
 - Are these times coordinated to improve efficiency?



Routing Decisions

Staggered Bell Times

- High School

- 8:00am



- Middle School

- 8:00am



- Elementary School

- 8:00am



* If all three schools start at the same time, then three buses are required to get the students to school.

Reusing buses by staggering bell times reduces the number of buses and costs.



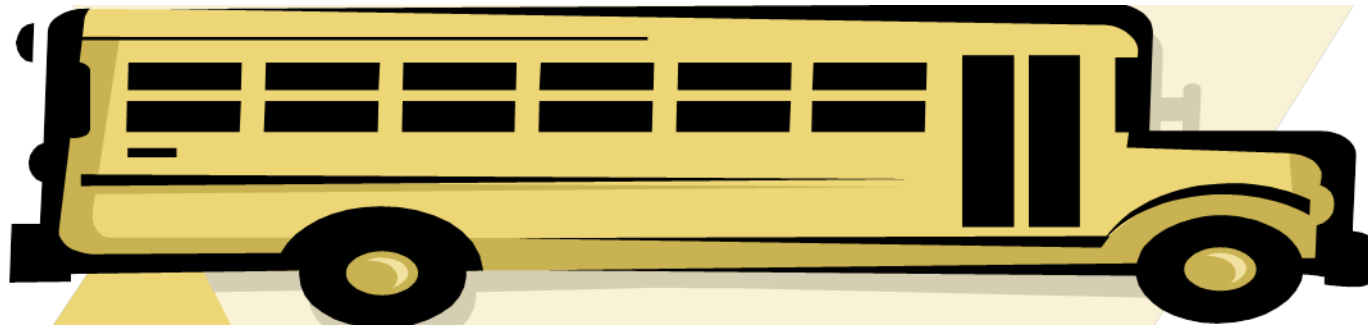
Routing Decisions

Staggered Bell Times

High School

Middle School

Elementary School



7:30 AM
School Start

8:15 AM
School Start

9:00 AM
School Start

Offsetting bell times by 45 minutes under the same scenario reduces route fulfillment requirements from three buses to ONE bus.



Routing Decisions

Improving Efficiency by Reducing Time & Miles

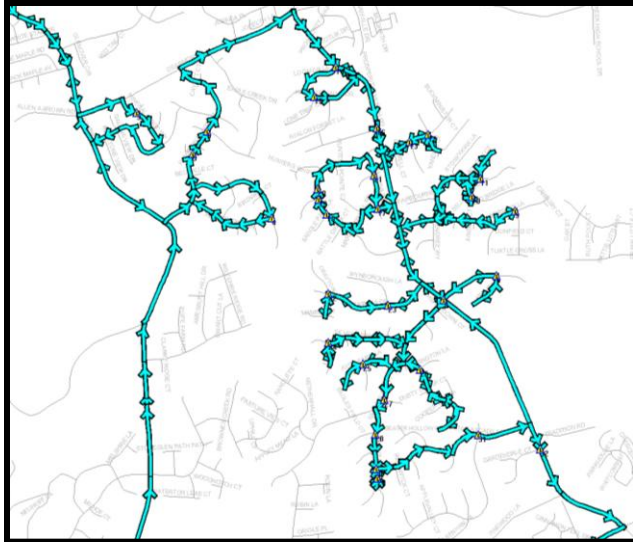
- Many districts have started creating neighborhood ‘community stops*’ within:
 - Housing developments
 - Subdivisions
 - Small neighborhoods
- These reduce the number of miles and driver hours accumulated each day as well as a decrease in student ride times.
- Community Stops should be reviewed to ensure student safety will not be comprised



Community Stops

Improving Service by Reducing Time & Miles

Before



Cost: 31 miles one way
62 miles per day
 $62 \times \$2.00 = 124.00$
 $\$124.00 \times 180 \text{ days} = \$22,320$

After



Cost: 18 miles one way
36 miles per day
 $36 \times \$2.00 = 72.00$
 $\$72.00 \times 180 \text{ days} = \$12,960$

\$9,360 savings for 1 bus



Community Stops

Improving Efficiency by Reducing Time & Miles

- Utilizing 'community stops' in conjunction with staggered bell times will result in an extremely efficient transportation operation and will produce:
 - Driver Salary Savings
 - Fuel Savings
 - Maintenance & Support Cost Savings
- TIMS features a simulation module in which you can experiment with altering your transportation plan and then examine the potential savings before implementing the changes.



Routing Decisions

Examining the Impact of Community Stops

- Over the summer, Iredell-Statesville Schools discontinued 'home stops' for middle and high school students within certain areas and relocated over 500 stops by creating 'community stops'.

2010-2011 Mileage Reductions: Iredell-Statesville School						
School(s)	# of Buses	Miles Reduced	Savings: Bus Miles* (1)	Savings: Driver Wages (2)	State Bus Replacement Expenses (3)	Total Estimated Savings (1+2+3)
LNHS	27	224	\$110.82	\$73.28	\$109.23	\$293.33
NIHS/NIMS	30	477	\$235.73	\$44.49	\$232.34	\$512.55
SIHS/TMS	23	313	\$154.77	\$52.63	\$152.54	\$359.94
WIHS/WIMS	25	225	\$110.98	\$6.14	\$109.39	\$226.50
SHS	10	72	\$35.36	\$16.52	\$34.85	\$86.73
EIMS	13	138	\$68.05	\$15.58	\$67.07	\$150.69
LMS	12	150	\$74.03	\$49.44	\$72.96	\$196.43
BMS	20	289	\$142.96	\$74.10	\$140.91	\$357.98
Daily Total	160	1888	\$932.69	\$152.57	\$919.29	\$2,004.55
Annual Total	160	339,777	\$167,883.82	\$27,463.32	\$165,471.40	\$360,818.53

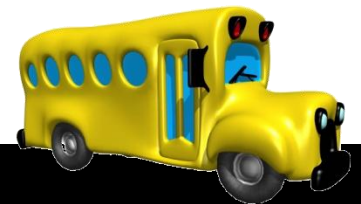


Funding and Safety

- Caution – If plans are so different that students and parents choose NOT to ride the bus.....
 - Lower Student Count without reducing cost or buses means a lower budget rating
 - Fewer students riding the bus means that overall safety is reduced



Data Analysis



TIMS DATA

- TIMS Data are used in a number of statewide reports:
 - Transportation Service Indicators Report
 - LEA Funding Formula
 - NCDOT Railroad Crossing Report
 - TDTIMS Annual Transportation Audit



TIMS Data & Service Indicators

www.ncbussafety.org/TIMS.html



Transportation Service Indicators Report

2009-2010



Public Schools of North Carolina
State Board of Education
Department of Public Instruction

- TIMS Data are published annually for each district as a means of comparison on a number of key measures:
 - Student Ride Times
 - Student Distance to School
 - Student to Stop Distance
 - Early Pickup/Late Drop-off Times
 - School Bell Times
 - Number of Bus Runs per Route



Service Indicators

TIMS Service Indicators Table of Contents

Page	Service Indicator	State Average
2-3	Average Student Ride Time, AM	23 minutes
2-3	Average Distance to School, Riders	4.37 miles
2-3	Average Distance to School, All Students	4.27 miles
4-5	Average of Longest 5% of Student Ride Times	70 minutes
4-5	Average Distance to School for Longest 5% of Ride Times	8.58 miles
6-7	Average of Student-to-Stop Distances < 1 Mile	470 feet
6-7	% of Stop Distances > .5 & < 1 Mile	1.39
6-7	% of Stop Distances < 1 Mile = 0	29.04
8-9	Earliest Morning Pickup Time	5:52 AM*
8-9	Arrival Time for Earliest Morning Pickup	7:38 AM*
10-11	Percent of Routes with Multiple Runs from the Same School	6.89
Operations Choices Affecting Service		
12	Range of School Start Times	62 minutes
13	Average Number of Runs per Rte, PM	1.65
13	Percent of Routes with More than One Run, PM	47.01

- The Transportation Service Indicators Report examines state averages for multiple transportation variables to understand the level of service received by the typical school bus rider in North Carolina.



Service Indicators

TIMS Data

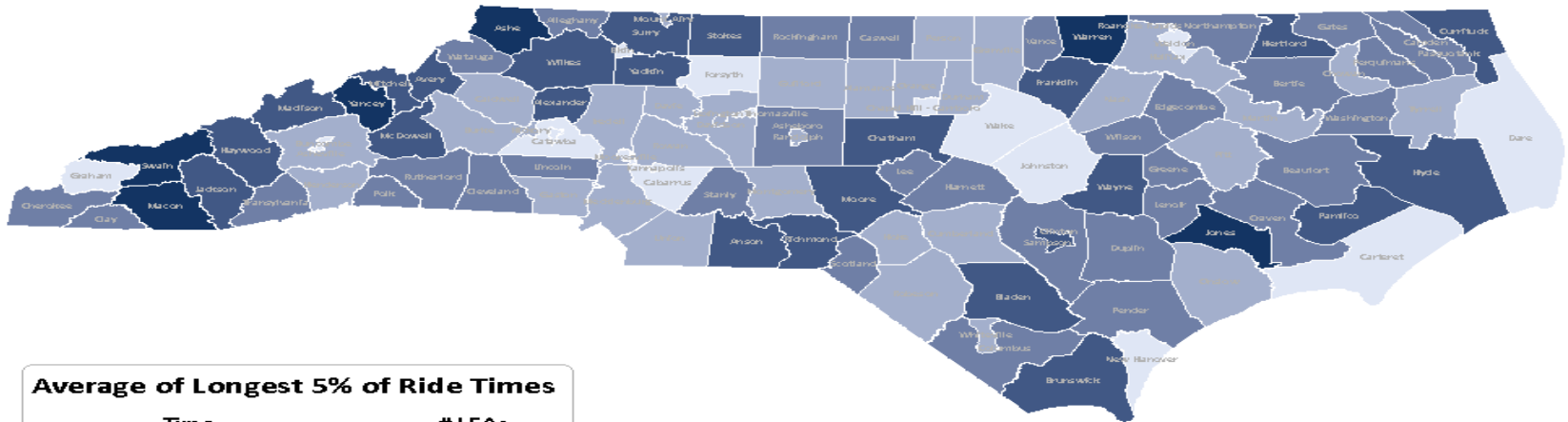
Report: QMF_MINMAX.TXT			
To:	Earliest Morning Pickup	Earliest Morning Bell Time	Latest Morning Bell Time
	5:35 AM	7:45 AM	8:45 AM
From:	Latest Afternoon Dropoff	Earliest Afternoon Bell Time	Latest Afternoon Bell Time
	5:06 PM	2:05 PM	3:00 PM
Time Format - X:XX			
Report: QMF_RCNT.TXT			
Buses	261		
Report: QMF_RTM.TXT			
Miles	14988.37	Hours	852
Report: QMF_RIDE.TXT			
Riders	15382		

- Prior to publishing the Service Indicators, each LEA is given the opportunity to review the data for their district.



Service Indicators

Average of Longest 5% of Student Ride Times



Average of Longest 5% of Ride Times

Time	# LEAs
1 hour or less	18
61-75 minutes	33
76-90 minutes	34
91 minutes-2 hours	24
Over 2 hours	6

Source: North Carolina LEAs, 2009-2010



- The data for each district is then displayed in categorical groupings on the state map



Service Indicators

TIMS Service Indicators, 2009-2010: Longest 5% of Student Ride Times

LEA	Average of Longest 5% Ride Times	Avg Dist for Longest 5% Ride Times	LEA	Average of Longest 5% Ride Times	Avg Dist for Longest 5% Ride Times	LEA	Average of Longest 5% Ride Times	Avg Dist for Longest 5% Ride Times
Alamance-Burlington	65-	7.48-	Edgecombe	85+	10.15-	Chapel Hill-Carrboro	36+	3.38-
Alexander	95+	6.91-	W-5/Forsyth	50-	7.55+	Pamlico	108+	12.32-
Alleghany	86-	10.80+	Franklin	98+	8.38+	Pasquotank	79-	7.65-
Anson	95-	11.43-	Gaston	74-	4.67+	Pender	78=	12.87-
Ashe	127+	13.78+	Gates	82=	8.24+	Perquimans	89-	12.28+
Avery	109+	11.38+	Graham	49+	11.02+	Person	69-	11.52+
Beaufort	88+	12.64+	Granville	66+	10.21-	Pitt	73+	7.24-
Bertie	84+	16.02+	Greene	89-	9.71+	Polk	89-	8.48+
Bladen	95-	18.29+	Guilford	73-	8.00+	Randolph	82=	7.43-
Brunswick	102+	13.80+	Halifax	62-	13.37+	Asheboro	62+	2.17-
Buncombe	70-	7.35+	Roanoke Rapids	30-	2.23-	Richmond	106-	7.24-
Asheville	35-	3.18-	Weldon	53-	9.36+	Robeson	63-	6.03-
Burke	69+	7.11-	Harnett	82+	7.86+	Rockingham	81=	8.61-
Cabarrus	50-	6.19=	Haywood	97-	10.10-	Rowan-Salisbury	74-	7.03-
Kannapolis	49+	2.71+	Henderson	75-	6.78+	Rutherford	83-	9.60+
Caldwell	65-	7.54-	Hertford	92+	12.50-	Sampson	80-	11.4+
Camden	89+	15.03+	Hoke	61=	11.54+	Clinton	91+	5.05+
Carteret	59-	13.39-	Hyde	93+	23.26+	Scotland	80-	11.75+
Caswell	90+	13.99+	Iredell-Statesville	64-	8.57+	Stanly	76=	6.37+
Catawba	59-	6.98+	Mooreville	42+	3.96+	Stokes	102-	9.34-
Hickory City	65=	5.32+	Jackson	109+	12.16+	Surry	100+	6.49+
Newton-Conover	53-	7.03-	Johnston	58+	8.82+	Elkin	48	6.14-
Chatham	91+	10.57+	Jones	135+	10.69-	Mount Airy	74	1.49
Cherokee	83-	8.53+	Lee	84+	5.84-	Swain	134+	11.15+
Edenton/Chowan	72-	13.24-	Lenoir	87+	10.00+	Transylvania	82-	7.73+
Clay	86-	9.59+	Lincoln	77+	5.57-	Tyrell	75+	11.53+
Cleveland	88+	6.31-	Macon	148-	8.77+	Union	61-	9.29+
Columbus	83+	12.78+	Madison	108-	15.15+	Vance	86-	6.86-
Whiteville	74+	5.35+	Martin	73-	8.46-	Wake	56-	9.97+
Craven	77-	12.44-	McDowell	91-	7.88-	Warren	136+	12.01+
Cumberland	63-	6.00-	Charlotte-Meck.	63-	9.65+	Washington	76+	7.13-
Currituck	120-	16.06+	Mitchell	92-	11.53-	Watauga	77-	10.77-
Dare	60-	14.47+	Montgomery	71-	10.38-	Wayne	95-	5.78-
Davidson	73-	5.91-	Moore	96-	8.08+	Wilkes	110+	9.19+
Lexington	66-	2.19+	Nash - Rocky Mount	73+	8.31-	Wilson	77-	6.34+
Thomasville	34+	1.92-	New Hanover	59-	5.75-	Yadkin	107+	7.16-
Davie	67-	9.53=	Northampton	77-	9.04-	Yancey	131+	7.85-
Duplin	81-	10.39+	Onslow	68-	9.70+			
Durham	65=	6.96+	Orange	73-	11.27+	State Average	70-	8.58+

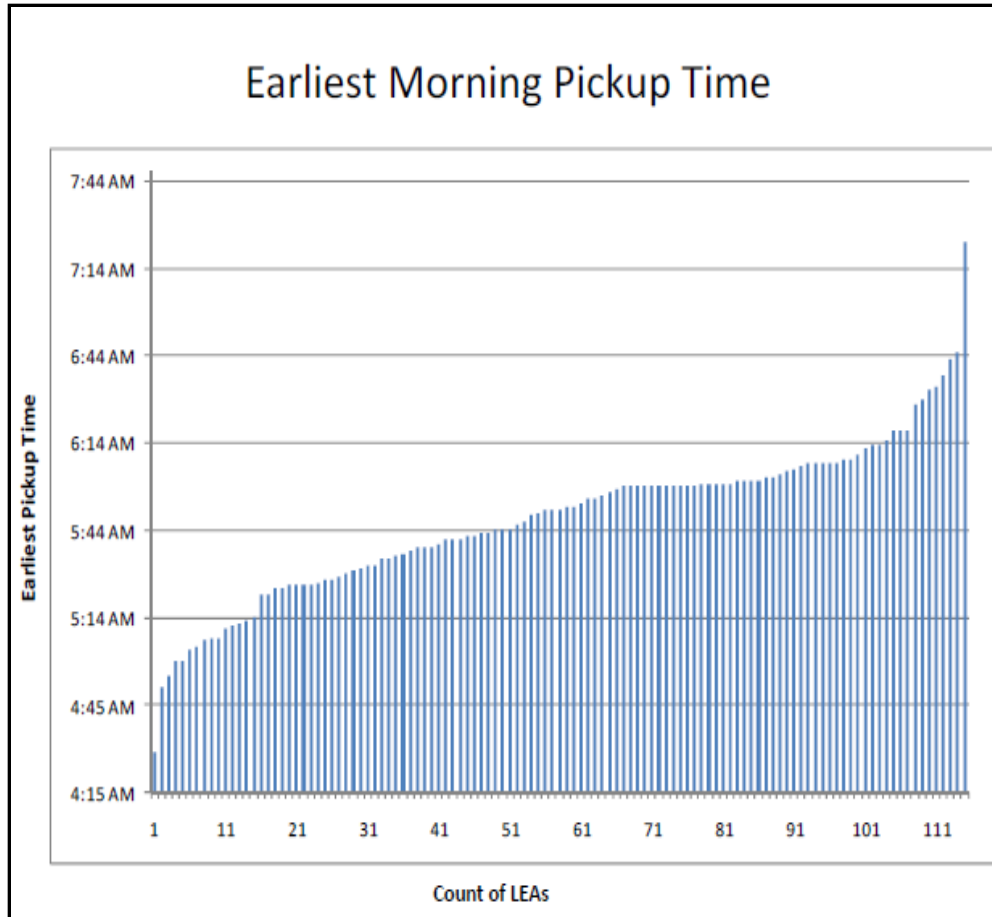
Symbols indicate change from previous year: + - later time or longer distance, - - earlier time or shorter distance, = - no change, no symbol - new data this year.
Source: NC Local Education Agencies 2009-2010 TIMS Data. Compiled at UNC Charlotte Urban Institute.

- The actual numbers and change from the previous year are also reported for each district and can indicate improved or diminished services for students.



Service Indicators

The Importance of Accurate Data



STATE-WIDE MEDIAN	2009-10
Earliest Morning Pickup Time	5:52 AM
Arrival Time	7:38 AM

- Inaccurate data in TIMS can result in misleading service indicators for your LEA and the entire state:
 - 65 Districts indicate their earliest stop occurs before 6:00am
 - 11 districts show their earliest stop is before 5:15am
 - 2 districts show their earliest stop time is before 5:00am



Annual DPI Reports: TD-2, TD2-R & TDTIMS

- TD2: For one week each year every LEA must count the number of bus riders as part of Daily Transportation To and From School.
- TD2-R: October 15th each LEA must report the daily bus routes, driver hours and miles travelled as part of To and From School Transportation
- TDTIMS: The data is then compared to TIMS Information as part of the Annual Audit, which occurs the first week of November.



TDTIMS Annual Audit

Non-Driving Time

Minutes Per Bus Per Day 20

DPI Data

Spreadsheet: TD2 > Unit Summary sheet, cell I22 or I23

Grand Total - Number of Students Transported 15019

Spreadsheet: TD2R > Summary sheet, cells H40, D40, C40

Total Miles 15076 Total Hours 1034.474 Buses 261

TIMS as % of DPI

	Riders	Miles	Hours	Buses
TIMS	15382	14988.37	852	261
			87 - Total Non-Driving Time in Hrs	
			939 - Total TIMS Time	
DPI	15019	15076	1034.474	261
%	102.42%	99.42%	90.77%	100.00%

- TIMS Data is compared to information reported in the TD-2 & TD-2R.
- TIMS data must fall within 90% of the TD2 & TD2-R to pass the audit.
- Student Ridership and Routing Information are then used in statewide reports.



TDTIMS Annual Audit

	Riders	Miles	Hours	Buses
TIMS	15382	14988.37	852 87 939	261
			Total Non-Driving Time in Hrs	
			Total TIMS Time	
DPI	15019	15076	1034.474	261
%	102.42%	99.42%	90.77%	100.00%

- Many LEAs find it difficult to reach a 100% match on driver hours between TIMS and the TD2-R.
 - TIMS shows only 939hrs are needed for Student Transportation
 - TD2-R shows 1,034 hours are being paid daily
 - Inaccurate Routes in TIMS?
 - Overpaying Drivers?
- Fuel & Driver Salaries are over 50% of your budget



LEA Funding Formula:

The Importance of Accurate Data

Student data entry form

Last Name: DOE School: 302 District ID: 000000123456 Elg: 0 U: 99
First Name: JOHN Grade: 06 Edulog ID: 3 Goto:
Date of Birth: 01/01/1997 Program: Sch. Distance: 1.16 mi Copy Fields

Location: 447 CHANNEL DR Home Stop Home Stop
Res Addr: 447 CHANNEL DR Copy Special Needs Special Ed
Other Needs

AM Transport Location: AM Shuttle:
PM Transport Location: Copy PM Shuttle:

Other Fields: Att Bndry | Trips | Picture | Print | School Path | Quick Assign
Confirm | Cancel | Delete | Previous | Next | Walk Path | Discipline

I...	P/U Location	Stop Description	Run
1	=HOME	CHANNEL DR & WEDGEWOOD CI	MTV
2	=SCHOOL - 302	CHANNEL DR & WEDGEWOOD CI	MTV

- In addition to misleading service indicators for your district, inaccurate student assignments in TIMS can impact your annual transportation allotment.
- One key statistic from TIMS utilized in the funding formula is the Student to School Distance of your assigned riders.
- The formula uses this statistic to determine the distance from home for students who are transported each day and assists in equalizing the allocation process between rural and urban areas.



Data Auditing



Auditing Student Ridership

Examining Annual Changes at the School Level

School	2007-2008 Riders	2007-2008 Students	2008-2009 Riders	2008-2009 Students	Rider Difference	Student Difference	% Change in Riders	% Change in Students
312	223	440	273	559	50	119	22%	27%
320	161	429	170	454	9	25	6%	6%
372	156	264	152	247	-4	-17	-3%	-6%
351	92	529	160	537	68	8	74%	2%
358	72	661	127	637	55	-24	76%	-4%

- The accuracy of TIMS can be explored by examining the annual changes at the school level between student population and student ridership
- These two numbers should show echo one another each year but could be impacted by changes to
 - School Grade Composition
 - School Boundaries
 - Enforcement of Walk Zones

*We are looking into conducting a School-Level Analysis of changes in Population and Ridership for each LEA as part of the TDTIMS Annual Audit



Gathering Mileage Data from BSIP

- Determine miles travelled over a time period (MCIS or ZIE36D)
- Determine days of travel captured by that mileage for each vehicle
 - Highly dependent on the fueling cycle in your county for each vehicle. These reports will give miles travelled in a particular period.
 - If a bus is fueled on Mondays and Thursdays, and you pull the Monday-Friday data, it will show you miles travelled from the previous Friday mid-day through the current Thursday mid-day.
 - If in the same situation you pull Tuesday-Thursday data, it will show you no advancement because 12:01am Tuesday – 12:01am Thursday the vehicle shows the same mileage in SAP
 - The same issues apply to monthly data
 - Also dependent on document entry. However, if proper dates are being used, you just have to assure all necessary fuel sheets have been entered.
- Convert miles travelled over a time period to miles travelled per school day and compare to TIMS data



Standard analysis Edit Goto View Extras Settings System Help

Standard analysis for info structure S731: Selection

SelectVers. User settings Standard drilldown

Characteristics

Maintenance plant	6050	to		↔
Equipment category	I	to		↔
Object class	6000	to	6100	↔
Construction year		to		↔
Equipment		to		↔
Inventory number		to		↔
MaintActivityType		to		↔
Division		to		↔
Room		to		↔

Period to analyze

Month	08/2010	to		↔
-------	---------	----	--	---

Parameters

Analysis currency	USD
Exception	

PRD (1) (600) prdapp3 OVR

MCIS Monthly Report:

1. Plant
2. Object Class (6000-6100 covers yellow buses)
3. Month to find miles travelled

Standard analysis for info structure S731: Drilldown

No. of Inventory number: 45

Inventory number	Miles/Km	Fuel Volume	Cost of fuel
Total	16,361.000 MI	2,436.600 GAL	5,209.01 USD
6050-0004	159.000 MI	25.300 GAL	54.09 USD
6050-0005	81.000 MI	24.300 GAL	51.95 USD
6050-0006	370.000 MI	53.400 GAL	114.16 USD
6050-0007	679.000 MI	92.200 GAL	197.11 USD
6050-0011	162.000 MI	24.300 GAL	51.95 USD
6050-0012	164.000 MI	28.800 GAL	61.57 USD
6050-0015	290.000 MI	50.700 GAL	108.39 USD
6050-0017	370.000 MI	48.000 GAL	102.61 USD
6050-0020	215.000 MI	28.100 GAL	60.07 USD
6050-0021	482.000 MI	73.400 GAL	156.91 USD
6050-0022	428.000 MI	56.300 GAL	120.35 USD
6050-0023	730.000 MI	128.200 GAL	274.07 USD
6050-0024	524.000 MI	75.600 GAL	161.62 USD
6050-0025	251.000 MI	29.900 GAL	63.92 USD
6050-0026	612.000 MI	84.000 GAL	179.57 USD
6050-0027	565.000 MI	83.400 GAL	178.30 USD
6050-0028	882.000 MI	164.300 GAL	351.23 USD
6050-0029	510.000 MI	63.700 GAL	136.18 USD
6050-0030	1,605.000 MI	168.200 GAL	359.57 USD
6050-0031	37.000 MI	15.700 GAL	33.56 USD
6050-0038	865.000 MI	117.600 GAL	251.42 USD

PRD (1) (600) prdapp3 OVR

Transfer to XXL

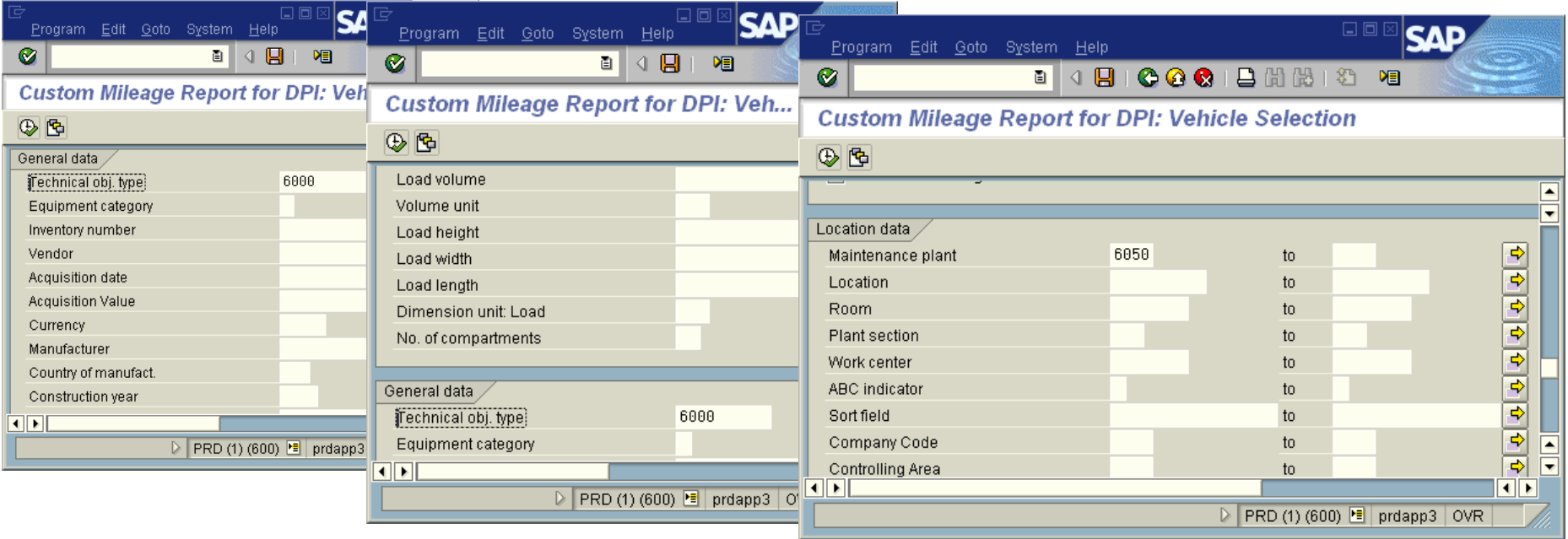
Please choose the ch

- Construction year
- Division
- Equipment
- Equipment category
- Inventory number
- MaintActivityType
- Maintenance plant
- Object class
- Room
- Month

✓ 📄 🗑️ ✗

MCIS Monthly Report:

1. Switch Drilldown to Inventory Number
2. Export to Excel using the Standard analysis menu tree
3. Export with Inventory Number as the only selection
4. Convert monthly mileage to daily or daily TIMS to monthly based on school calendar and fueling schedule



ZIE36D Mileage Report:

1. Counter Reading Date
2. Technical obj. type (6000 for school buses)
3. Maintenance Plant
4. You'll need to run this report twice, once for the start date and once for the end date



Custom Mileage Report for DPI: Vehicle List

S	InvNo.	Description of technical object	User Status	Total Meter	Past Meter
	6050-0004	65 PASS FORD C-5.9 THO BODY	E2RB	111,845	111,521
	6050-0005	65 PASS FORD C-5.9 THO BODY	E2RB	137,154	136,810
	6050-0006	65 PASS FORD C-5.9 THO BODY	E2RB	119,877	119,284
	6050-0007	66 PASS INTERNATIONAL VT365E	E2RB	38,439	37,746
	6050-0011	65 PASS FORD C-5.9 THO BODY	E2RB	116,268	115,960
	6050-0012	66 PASS FORD C-5.9 THO BODY	E2RB	83,174	82,865
	6050-0015	66 LIFT INTERNATIONAL VT365E	E2RB	70,878	70,301
	6050-0017	66 PASS FORD C-5.9 THO BODY	E2RB	163,651	162,950
	6050-0020	66 PASS FORD C-5.9 THO BODY	E2RB	145,756	145,347
	6050-0021	66 Pass Freightliner MBE900	E2RB	39,544	38,732
	6050-0022	66 Pass Freightliner MBE900	E2RB	59,756	58,910
	6050-0023	66 Pass Freightliner MBE900	E2RB	33,010	31,998
	6050-0024	66 Pass Freightliner MBE900	E2RB	43,630	42,815
	6050-0025	54 Lift Flat Floor Freightliner MBE900	E2RB	71,444	70,402
	6050-0026	66 Lift Freightliner MBE900	E2RB	53,573	52,589
	6050-0027	54 Pass Freightliner Cummins ISB 6.7L	E2RB	29,590	28,566
	6050-0028	54 Pass Freightliner Cummins ISB 6.7L	E2RB	18,714	17,969
	6050-0029	54 Lift Freightliner Cummins ISB 6.7L	E2RB	23,125	22,042
	6050-0030	66 Pass IC MaxxForce DT	E2RB	2,731	1,818
	6050-0031	66 PASS FREIGHTLINER CAT 3126 THO BODY	ESS	208,074	207,933
	6050-0038	54 PASS FC NAVISTAR DT360 THO BODY	E2RB	146,941	146,200

PRD (1) (600) prdapp3 OVR

ZIE36D Mileage Report:

- 1.Sort Results by Inventory Number (Bus Number)
- 2.Ignore Total Meter (that's current data)
- 3.Inventory Number and Past Meter are the necessary columns

Worksheet in Basis (1) - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

G2 fx =C2-F2

	A	B	C	D	E	F	G
1	Inventory no.	Description	Past Meter New	Inventory no.	Description	Past Meter Old	Miles Travelled
2	6050-0004	65 PASS FORD	111,845	6050-0004	65 PASS FORD	111,521	324
3	6050-0005	65 PASS FORD	137,154	6050-0005	65 PASS FORD	136,810	344
4	6050-0006	65 PASS FORD	119,877	6050-0006	65 PASS FORD	119,284	593
5	6050-0007	66 PASS INTER	38,439	6050-0007	66 PASS INT	37,746	693
6	6050-0011	65 PASS FORD	116,268	6050-0011	65 PASS FORD	115,960	308
7	6050-0012	66 PASS FORD	83,174	6050-0012	66 PASS FORD	82,865	309
8	6050-0015	66 LIFT INTERN	70,878	6050-0015	66 LIFT INTE	70,301	577
9	6050-0017	66 PASS FORD	163,651	6050-0017	66 PASS FORD	162,950	701
10	6050-0020	66 PASS FORD	145,756	6050-0020	66 PASS FORD	145,347	409
11	6050-0021	66 Pass Freigh	39,544	6050-0021	66 Pass Freigh	38,732	812
12	6050-0022	66 Pass Freigh	59,756	6050-0022	66 Pass Freigh	58,910	846
13	6050-0023	66 Pass Freigh	33,010	6050-0023	66 Pass Freigh	31,998	1,012
14	6050-0024	66 Pass Freigh	43,630	6050-0024	66 Pass Freigh	42,815	815

Select destination and press ENTER or choose Paste

Sheet1 100%

ZIE36D Mileage Report:

1. Export the resulting two reports to Excel
2. Line up the results in excel and subtract the two “Past Meter” columns to find the miles travelled during that period of time
3. Convert this mileage to daily mileage based. Remember initial cautions regarding this conversion.



Auditing Bus Routes

Assessing Driver Compliance

- If your TIMS data is an accurate representation of your daily transportation operations, then assessing driver compliance is quite simple as TIMS Data can be compared to
 - Driver Hours & Payroll
 - BSIP Odometer Mileage
- Both of these comparisons are irrelevant if your TIMS Data is inaccurate.



Auditing Bus Routes

Assessing Driver Compliance

Mileage		Time	
		Negative slack is not included in totals, but indicates problems with bell times or run lengths that should be corrected.	
Route 104		Route Times in Minutes	
<hr/>			
334.007			
Loaded	28.42	Loaded + Checkpoint	95
Deadhead	0.00	Deadhead	0
Checkpoint	9.14	Slack	0
		Negative Slack	0
Total	37.55	Total	95
<hr/>			
334.107			
Loaded	34.27	Loaded + Checkpoint	103
Deadhead	0.00	Deadhead	0
Checkpoint	5.68	Slack	0
		Negative Slack	0
Total	39.94	Total	103
<hr/>			
Summary for Route 104			
Loaded	62.68	Loaded + Checkpoint	198
Deadhead	0.00	Deadhead	0
Checkpoint	14.81	Slack	0
		Negative Slack	0
Total	77.50	Total	198

- TIMS features a number of reports that can assist in assessing driver compliance.
- The RTE Time & Miles Summary displays the exact number of miles and minutes needed for each Bus.
 - AM Runs
 - PM Runs
 - Daily Total

Auditing Bus Routes

Assessing Driver Compliance

RTE ID	RUN ID	Begin Time	End Time	Total Miles	# of Minutes
1	310.003	6:47 AM	7:25 AM	15.382	38
1	310.103	2:02 PM	2:56 PM	15.8136	54
100	322.002	5:39 AM	7:34 AM	37.7627	115
100	322.102	2:10 PM	4:15 PM	37.8896	125
101	320.004	6:38 AM	7:45 AM	23.7038	67
101	320.104	2:55 PM	4:16 PM	23.8583	81
102	322.001	6:38 AM	7:34 AM	18.8776	56
102	322.101	2:10 PM	3:05 PM	13.8136	55
103	320.002	6:49 AM	7:45 AM	19.7479	56
103	320.102	2:55 PM	4:09 PM	21.485	74
104	334.007	6:15 AM	7:50 AM	37.5534	95
104	334.107	3:10 PM	4:53 PM	39.9424	103

- TIMS Data Managers are able to examine the number of miles and minutes for each AM or PM run and the daily totals for a single driver, bus or school.
- This data can then be compared to driver payroll and BSIP to assess compliance.
- Some LEAs use TIMS to establish driver hours for the upcoming year, while others continue to rely on “estimates” from school personnel.



Auditing Bus Routes

Examining TIMS Data

RTE ID	RUN ID	Begin Time	End Time	Total Miles	# of Minutes
1	310.003	6:47 AM	7:25 AM	15.382	38
1	310.103	2:02 PM	2:56 PM	15.8136	54
100	322.002	5:39 AM	7:34 AM	37.7627	115
100	322.102	2:10 PM	4:15 PM	37.8896	125

- Bus 100 shows a total of 240 minutes of driving time (4 hours) is needed each day to complete the route as designed in TIMS. This figure does not typically include pre/post inspection time.
- TIMS allows the inclusion of extra time before and after the established run to account for this or LEAs may add this additional time on their own.
- Route Time & Miles reports are highly dependent upon an accurate representation of your LEA in TIMS
 - School Bell Times: Early/Late Windows
 - Stop Placement & Stop Order
 - Map Calibration (Road Speed, Turnarounds ,Checkpoints, etc)



Auditing Bus Routes

Examining BSIP Data for a Single Bus

BUS #	Date	Miles
145	9/4/2009	1
145	10/15/2009	68
145	10/13/2009	71
145	9/14/2009	91
145	9/2/2009	92
145	9/17/2009	92
145	10/6/2009	93
145	10/8/2009	93
145	9/11/2009	94
145	9/29/2009	94
145	9/25/2009	95
145	9/30/2009	95
145	10/5/2009	95
145	9/18/2009	96
145	9/22/2009	96
145	10/20/2009	96
145	10/19/2009	97
145	10/28/2009	98
145	9/1/2009	101
145	9/9/2009	183
145	10/26/2009	300
Fueling Average		102
Fueling Median		95

- BSIP contains the number of miles accumulated by every bus between each fueling
- Buses are typically fueled on a consistent cycle, albeit every 1-5 days, depending upon your LEA
- BSIP Mileage Data can be inconsistent:
 - Bus Maintenance, Inspections, Snow Days, Afterschool Programs, etc.
- The Fueling Average for Bus 145 is 102 miles, which is inflated because of a few very high values
- The Fueling Median for Bus 145 is 95 miles and is more indicative of the typical mileage between fueling.
- Bus 145 is fueled every 2 Days
- Average Daily Miles ~ 48



Auditing Bus Routes

Assessing Driver Compliance & TIMS Accuracy

BUS #	Daily BSIP Miles	Daily TIMS Miles	Difference BSIP-TIMS	Tims % of BSIP
19	64	76	-13	120.0%
28	104	103	1	99.5%
31	95	95	0	100.4%
34	114	115	-1	100.8%
69	54	86	-32	160.1%
90	113	101	12	89.5%
103	135	94	40	70.1%
126	80	87	-7	109.0%
139	65	71	-6	109.0%
145	48	48	0	100.7%
148	80	75	5	93.7%
160	114	127	-13	111.6%
163	68	63	4	93.6%
164	103	103	-1	100.6%
181	65	64	0	99.5%
237	60	48	12	80.4%
246	114	113	0	99.8%
298	134	134	0	100.3%
303	110	121	-12	110.6%
307	80	70	10	87.2%
325	96	91	5	95.0%
348	126	126	0	99.9%
354	124	125	-1	100.4%
369	94	110	-16	117.0%

- Comparing the data in an Excel Spreadsheet can highlight specific buses, schools and drivers that may not be following the transportation plan from TIMS.
 - Driver Compliance
 - Inaccurate TIMS Data
- GPS Data can also be compared to TIMS and BSIP Miles
- Similar reports can be made to compare TIMS Hours with Payroll

*We are looking into conducting a Bus-Level Analysis of miles travelled for each LEA as part of the TDTIMS Annual Audit



Verifying the Transportation Plan and Driver Time

- The Fair Labor Standards Act requires that employees be paid for time worked.
 - For drivers this includes time driving, inspecting and cleaning the bus as well as waiting time at schools when they are required to be present.
 - **The use of state Funds to pay employees for more time than they are actually working is illegal.**
- Creating a transportation plan and not verifying that it is followed is being **naive**.



Verifying the Transportation Plan and Drivers Time

- Unless the fleet is equipped with GPS real-time tracking, there is no “automatic” way of knowing if the drivers are following the established run directions.
- Follow up when “Planned vs. Actual” doesn’t match
 - Driver feedback that affects how a bus route should be run should be communicated to the TIMS staff in the transportation department.
 - This could be information that impacts not only that one bus, but could affect many other buses in the fleet.
 - If the information is entered into TIMS, other drivers and routes could benefit from this knowledge



Verifying the Transportation Plan and Drivers Time

- When is the last time someone from transportation rode a bus with the copy of the run directions to audit directions, stop times, and travel speeds?
- When doing this to monitor driver performance, auditing the data can be done at the same time



INSPECT what you EXPECT!

- **BENEFITS** – More accurate information in the TIMS database will result in a more realistic and efficient transportation plan.
 - Riding the bus may also result in better communications between the drivers and the transportation planners.
 - Improved communications should mean that the drivers will understand the importance of sharing issues that affect their runs.
 - The net result is an improved transportation plan that means less cost.



Efficiency Seminar for School Transportation

