Attachment "A"

A RESOLUTION RECEIVING THE NCDOT TRAFFIC OPERATIONS STUDY AT FRANK PORTER GRAHAM ELEMENTARY SCHOOL
Resolution No. 154/2001-02

WHEREAS, the Carrboro Board of Aldermen seeks ample opportunities to review strategies for improving pedestrian safety and access.

NOW, THEREFORE BE IT RESOLVED by the Carrboro Board of Aldermen that the Aldermen have reviewed the report prepared by the N.C. Department of Transportation recommending strategies for improving pedestrian access and safety near the Frank Porter Graham site on Smith Level Road.

BE IT FURTHER RESOLVED by the Carrboro Board of Aldermen that the Aldermen recommend that Town staff bring together interested parties to discuss the report recommendations.

This is the 28th day of May in the year 2002.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

February 21, 2002

Art McMillan, PE
Project Engineer
Roadway Design Unit
Century Center Complex, Building A
1582 Mail Service Center

Dear Art:

SUBJECT: Traffic Operations Study at Frank Porter Graham Elementary School

Municipal and School Transportation Assistance (MSTA) received a copy of your letter dated January 7, 2002 that listed citizens response during a recent Public Hearing for project U - 2803. Addressed in this report are concerns with the operations and safety of traffic along Smith Level Road (SR 1919) at the Entrance to Frank Porter Graham Elementary School near the intersection ramps at NC 54. MSTA performed a field investigation at this intersection including the student loading operations at Frank Porter Graham Elementary School. This report offers recommendations that should provide a safer, more efficient, and organized student loading zone and help mitigate the concerns relating to school related traffic congestion and delays along Smith Level Road.

EXISTING TRAFFIC OPERATIONS AND ANALYSIS

Intersection of Smith Level Road and the Entrance to Frank Porter Graham Elementary School

Frank Porter Graham Elementary School is located in the southeast quadrant of NC 54 and Smith Level Road. Joining the school campus is Frank Porter Graham Child Development Center, part of the University of North Carolina. These facilities are accessed by a common Access Road located along Smith Level Road. Across from the Access Road is the Town of Carrboro Maintenance Complex. The speed limit along this section of Smith Level Road is 35 MPH and reduced to 25 MPH during school hours. A sidewalk is provided on the eastside of Smith Level Road from Morgan Creek Bridge north to the Carrboro Central Business District. This sidewalk is used by a small number of school children and parents and a small number of employees from the Center to access other UNC offices located along Smith Level Road. The Annual Average Daily Traffic (AADT) is 19,000 vehicles per day calculated during the year 1999. There are traffic signals at the intersections of Smith Level Road, both ramps of NC 54 and the school entrance. These three signals are interconnected to provide for increased traffic flow and to minimize traffic delays. Traffic along Smith Level Road during the morning flowed well.

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LOCATION:
CENTURY CENTER COMPLEX BUILDING B
1020 BIRCH RIDGE DRIVE

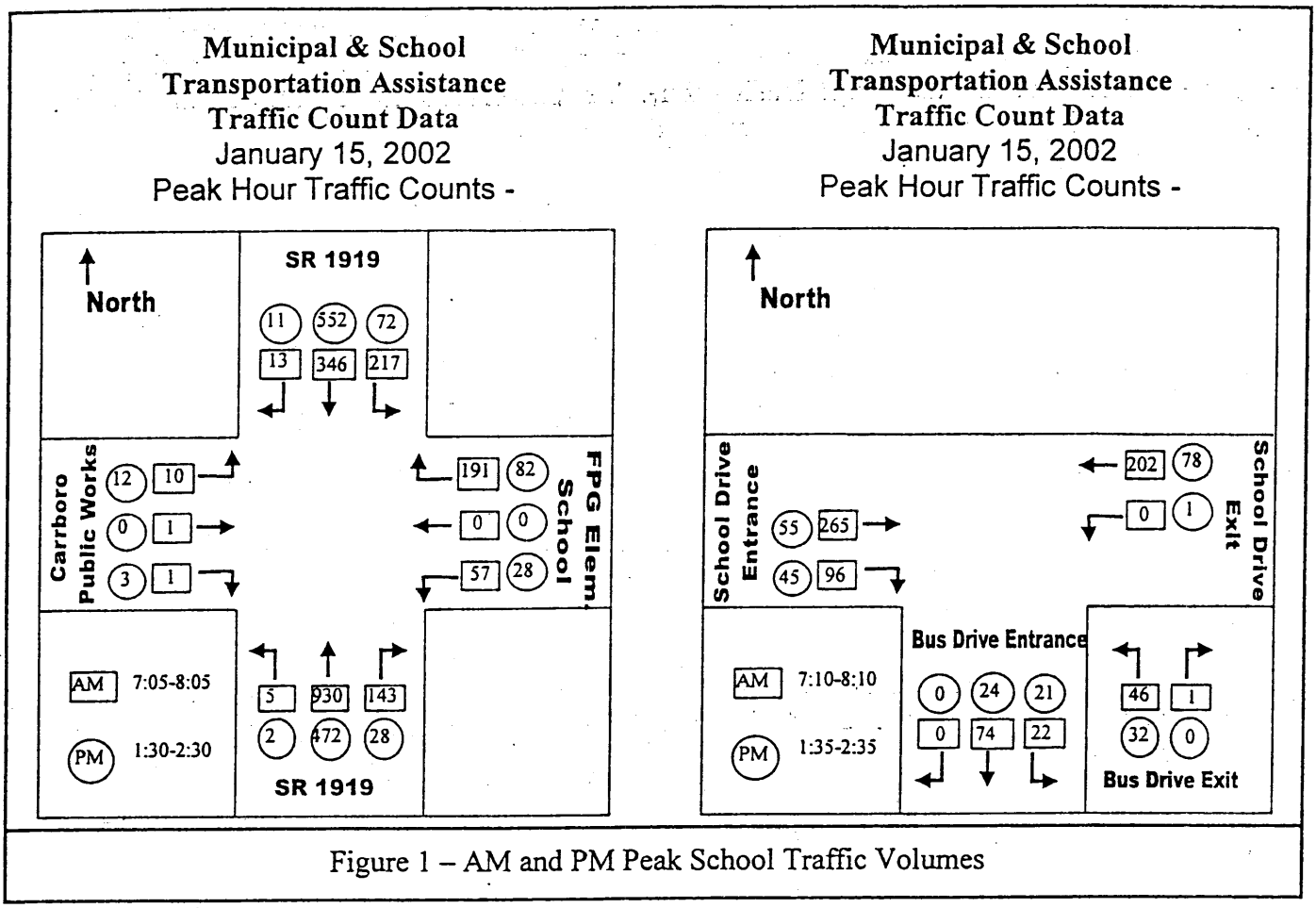


Figure 1 – AM and PM Peak School Traffic Volumes

Along Smith Level Road, during the school AM and PM peak hour traffic periods, delays and congestion at the intersections were considered normal. At no time did school related vehicles back from the school campus onto Smith Level Road. However, during the AM student loading time, vehicles did back from the student loading zone to this intersection. Observations indicated that this queue length was directly associated to traffic delays at the student loading process.

Traffic Operations at Frank Porter Graham Elementary School

The Access Roadway not only serves Frank Porter Graham Elementary School but also the Frank Porter Child Development Center. From the traffic signal, the Access Roadway has a "T" intersection, 14 perpendicular parking spaces along the south side, the student loading zone, a cafeteria driveway, and a faculty parking lot. Just before the faculty parking lot entrance, the driveway loops allowing vehicles to exit more easily.

- The ***"T" intersection*** provides access to the bus loading loop and the parking lot to the Child Development Center. The bus-loading loop allows buses to load students along the west side of the school building and continue back to the "T" intersection. Nine buses load at different times as they transport students to and from school. No buses remained parked on campus during the day. The bus loading operations were considered safe and efficient. No parents loaded students in the bus loading zone while buses were present; however, after the buses had left several were observed during the AM and PM loading period.
- The ***student loading zone*** is located along the south side next to the sidewalk in front of the main school building. Pavement markings identify the area as being 200 feet long and 8 feet

wide. Beside the student loading zone area, pavement markings identify an eastbound through lane, a painted center island, a westbound exit lane, and 13 parallel parking spaces. Before entering the student loading zone, three parking spaces are identified; the first is a regular parking space and then two handicapped spaces. There is no "Visitor Parking" identified for parents that have legitimate short term parking needs.

- The ***cafeteria driveway*** allows parking for four faculty members and a loading dock.
- The ***faculty parking lot*** has 48 perpendicular marked spaces.

Frank Porter Graham Elementary School operates from 7:25 AM to 2:30 PM and, serves a population of 680 students, enrolled in Kindergarten through Fifth grade. The school is staffed by 100 faculty and staff members. It should be mentioned the school provides only 82 parking spaces, two of which are handicapped.

In the morning, approximately 217 vehicles turn left and 143 turn right from Smith Level road into the school and 57 vehicles turn left and 191 vehicles turn right onto Smith Level Road leaving the school. Based on data collected at similar schools in North Carolina, Table 1 indicates that on an average day this school should provide a minimum queue length of 989 feet. This is the driveway storage length required to contain the school-generated traffic on campus. The site plan indicates the campus provides approximately 900 feet for student loading vehicles to queue. This distance is measured from the school entrance to, and including, the student loading area in front of the school. **The school does not provide adequate queue length to contain parental traffic within the school property.** However, with minor changes to the loading operations the existing queue length may be sufficient.

Table 1: MSTA School Calculator Worksheet

MSTA School Queue Input				Calculations				
Type School	Student Population	Number of Buses	Faculty Members	PM Total Number of Vehicles	PM Maximum Vehicles	PM Maximum Queue	Total AM Trips	Total PM Trips
Elementary	598	9	100	98	45	989	547	205

	AM Trips Generated				PM Trips Generated			
	Parents	Buses	Faculty	Trips	Parents	Buses	Faculty	Trips
IN	219	9	100	328	98			98
OUT	219			219	98	9		107
		Total AM Trips		547		Total PM Trips		205

When considering motorist safety, it is crucial that the school campus contains all the traffic that it generates. Important factors to reducing the affects of a high number of vehicles on a campus are the operations and organization of the student loading zone. Improving the student loading operations can improve the efficiency of the loading process by decreasing loading delays resulting in reduced traffic queues. Organizing the loading zone by defining the loading zone and educating the students and parents will improve pedestrian and motorists safety as well as help the loading operations become a success.

Data indicates that AM traffic operations on a school campus will usually operate safely and efficiently due to parental traffic arriving at a broader range of times. PM operations are quite different, the greater part of parents will arrive well before dismissal, and park or queue along the campus driveway. This PM queuing will often result in vehicles being stopped on or along the

shoulder of, an adjacent roadway, resulting in an increased possibility of accidents and similar traffic related concerns.

The Frank Porter Graham Child Development Center has a staff of approximately 150 employees and a daycare of 77 children. The daycare operates from 7:30 AM to 5:30 PM. Conferences, classes and tours are held at this facility. Clients, visitors and parents come and go throughout the day. There are 93 parking spaces provided by the university to accommodate the staff and parents at the Child Development Center. The parking for the center is by permit only and is strongly enforced, as there is a deficiency of parking spaces. Parents waiting for Frank Porter Graham Elementary School to dismiss, sometimes park in the development center parking lot creating additional problems.

AM Traffic Operations

Vehicles began arriving at approximately 7:14. The student loading zone had little supervision and no defined loading process. Most loading occurred in the center or the west end of the student loading zone. At 7:21 four vehicles were parked in and blocking the center of the loading zone and westward. Other vehicles were forced to pass or load beside the parked vehicle, in the through lane. On one occasion, a vehicle passed the loading area and after going through the loop parked in the center painted island. This created three lanes of vehicles loading and caused additional delays for vehicles entering campus.

At 7:38, vehicles begin parking in the parking spaces before the student loading zone. The first is a regular space while the next two spaces are handicapped spaces and one vehicle remained in one of the handicapped spaces until after 3:00 PM.

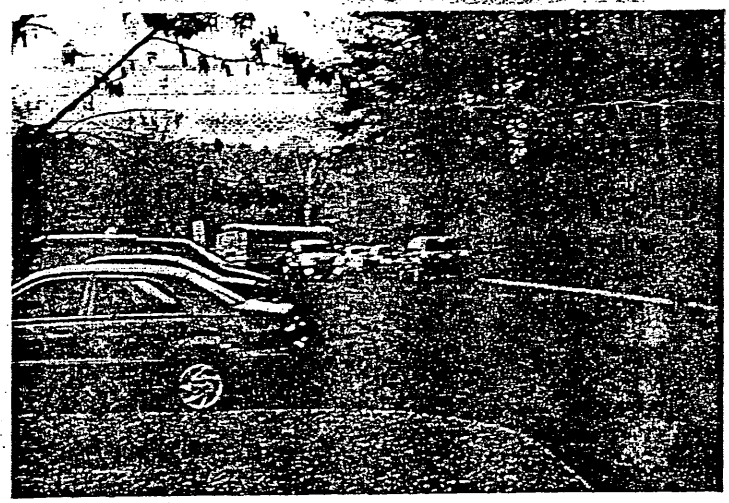
At 7:43, traffic conditions were at their peak. Approximately 20 entering vehicles queued from the loading zone to the traffic signal at Smith Level Road. Although this queue did diminish by 7:46 this queue was considered excessive and could be avoided by implementing a defined and more disciplined loading process. At 8:03 entering traffic stopped. During the loading process, several vehicles parked short term in a diagonally marked parking area east of the loading zone, near the Cafeteria driveway. Several vehicles were observed circumventing the intended loading process by loading at the bus loading area and in the Child Care Development Center parking lot.

At the traffic signal, vehicle counts indicated 57 exited left and 191 exited to the right. School traffic lasted for a period of approximately 45 minutes. During the peak 4 minutes, exiting vehicles queued from the signal approximately 450 feet toward the loading zone. No vehicles were observed delayed more than two cycle lengths. Considering the number of vehicles present

and the amount of through traffic along Smith Level Road, this queue was to be expected and no safety concerns were noted.

PM Traffic Operations

School related vehicles begin arriving at approximately 1:34. No parking was available on the school campus or at the Child Development Center. At first, parents stopped in the loading zone near the front door. Once the loading zone was filled others passed the loading zone, circled the loop and filled the exit lane. Others stopped in the isle of the faculty parking lot east of campus.



At 2:20 the school dismissed with faculty members observing the student loading operations. The student loading zone and exit lane was filled with parked vehicles. Several vehicles were left unattended with no driver. At 2:26 vehicles stopped in the center island creating three lanes of loading vehicles. Most parents got out of their vehicle, walked to the school doorway and returned with their child. Other students were escorted by a faculty member. No students were observed being unsupervised. By 2:45, most of the students had loaded with only a few still playing near the school building doorway. During this period, only a few vehicles queued pass the student loading zone. Several vehicles were observed loading in the bus loading area after the buses had exited and in the Child Development Center parking lot.

At the traffic signal, data indicated 28 vehicles exited left and 82 exited to the right. School traffic lasted for a period of 25 minutes. Traffic along Smith Level Road was considered light and exiting school traffic had few if any delays.

RECOMMENDATIONS

Data and on sight observations indicated that traffic operations along Smith Level Road during off peak periods are very good. During peak periods, especially the morning peak, traffic delays increase and back-ups do occur. Neither the delays nor back-ups are excessive considering the traffic volume and the close proximately of the Access Road and NC 54 ramp intersections. The majority of the delays in the morning are caused by the high number of vehicles traveling along Smith Level Road. If the Access Road were not there, the traffic would start to back up at the first traffic signal it encountered.

Traffic operations along Frank Porter Graham Elementary school are working well. According to the faculty staff, the day our observations and data were collected was a normal day. School traffic did not back into Smith Level Road, however traffic backed-up to Smith Level Road. During high demand days when activities are scheduled during school hours, delays are greater and school traffic will back-up into Smith Level Road. The following recommendations should alleviate most of these delays.

For short-term low cost improvements, it is recommended that a designated student loading zone with four loading bays be created along the curb located in front of the school building. The loading zone should be identified by installing 4-inch wide solid white pavement markings. Each bay should be a minimum of 8-feet wide, from the edge of curb, and the lengths of 20-feet for the end bays and 30-feet for the middle bays as shown on the attached Figure 2.

It will be necessary for a faculty member to be located at each of the loading bays to assist with each loading vehicle. It is recommended that a stop line be installed approximately 20-feet west of the first designated loading bay. The stop line should be a 6-inch wide solid white line extending across the driveway. "Stop Here" signs may need to be installed, at the stop line, to help indicate that traffic should stop and wait for the next available loading bay.

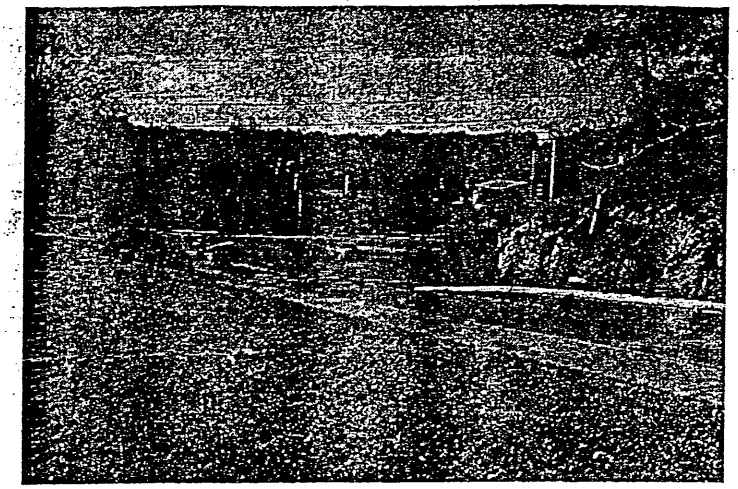
At least four short term parking spaces should be identified on the opposite side of the loading zone in the painted gore area in the center of the drive. This parking can be identified by installing "Visitor Parking" signs at the spaces to be assigned. These spaces are for parents requiring extended periods of time to load. If a parent stops in the loading zone, to wait to load their student, a loading assistant should direct that parent to the Visitor Parking.

Providing a safe and efficient student loading operation relies on the participation of everyone. The student, to assure they are ready to load in the quickest amount of time, the faculty, to assure organization at the loading zone is maintained and most of all the parent to be a responsible and patient driver assuring the quickest possible loading of their student and the use of defensive and courteous driving techniques on the school campus.

An "Advanced Identification" loading process may be adopted during the PM student loading period. To better organize and speed-up the student loading, this process will require the placement of a loading assistant (faculty member, parent volunteer, or identified student patrol) before the student loading zone Stop Bar. It would be the loading assistant's responsibility to determine the name of the next student to be loaded. This can be accomplished by having parents display the student's name on a flash card placed in the windshield of the car or by asking the parent. Once the information is obtained, it is forwarded (typically by walkie-talkie or megaphone) to another loading assistant who has access to the students. By the time the parent reaches the loading zone, the student is waiting next to the curb ready to get into the vehicle. Another loading assistant should be stationed at the loading zone to supervise and insure safe operations.

Vehicles parked in the two handicap parking spaces, located at the student loading zone, created a safety concern for pedestrians and traffic as well as unnecessary loading delays. These spaces should be removed from the student loading zone and relocated to the Faculty Parking Lot. To meet Americans with Disabilities Act (ADA) requirements, the first three parking spaces in the faculty parking lot should be re-marked as two handicap parking spaces. It may be necessary for standard curb cuts to be provided where the sidewalk meets the Faculty Parking Lot.

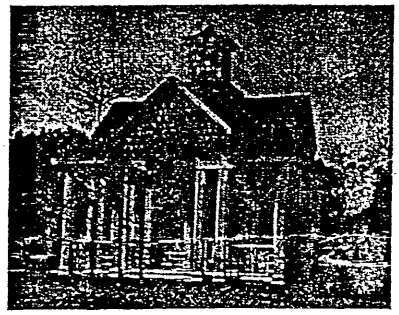
Additional Concerns



Field observations indicated that both the Elementary School and the Child Development Center have a lack of parking. Additional space for parking is not available on campus or adjoining property. In an effort to provide additional parking, one possible solution is to construct a parking lot at the Carrboro Maintenance Facility across Smith Level Road. It has been mentioned that this facility may be relocated within the next five years. Once constructed a pedestrian walkway could be constructed from the parking lot, under the bridge, and to the Frank Porter Graham facilities. This walkway would eliminate the vehicle / pedestrian conflicts at the Smith Level Road traffic signal providing the safest method of pedestrians to cross and allowing maximum signal timing for through traffic.

The entities that have an interest in providing parking and pedestrian improvements at the Smith Level Road Bridge are:

- The **Orange County School System** has a need for additional parking and could implement a satellite student loading zone. If school related traffic congestion becomes a concern on campus as well as the intersection of Smith Level Road, a satellite loading zone would help to reduce the related traffic and pedestrian safety concerns.

  The satellite loading zone would require a designated loading area with a shelter and sidewalks extending from the parking lot to the Frank Porter Graham facilities. Adult supervision would be necessary for loading and a "Walking School Bus" plan implemented for an organized crossing to the school building. MSTA is available to discuss details of implementing this process if necessary.

- The **University of North Carolina** (Child Development Center) has additional parking needs.

- The **Town of Carrboro** has a very successful and highly utilized pedestrian greenway west of the Maintenance Facility. Plans are to extend this facility to the Smith Level Road Bridge. Having access to a PM and weekend parking lot and a safe access to and crossing Smith Level Road would greatly improve accessibility and pedestrian safety to the community.

- The **Town of Chapel Hill** also has a greenway planned along the banks of the creek that will extend to the bridge from the east. It is anticipated that when these two greenways connect they will be heavily utilized. Construction of a parking lot and a connecting sidewalk provide a PM and weekend parking facility and a safe pedestrian crossing under Smith Level Road.

- The **North Carolina Department of Transportation** has discussed constructing sidewalks along each side of the Smith Level Road Bridge as part of the U – 2803 project. These sidewalks will provide an even greater community appeal and continuity to the proposed greenway passing under the bridge.

As a pro-active and cost effective means to provide the local community with a uniform and cohesive design, it is recommended that the Town of Carrboro create a sub-committee consisting of all interested parties. As indicated, constructing a parking lot on the Carrboro Maintenance Facility property and providing connecting sidewalks to the bridge and nearby greenways will help provide an alternative solution to traffic congestion and pedestrian safety concerns in this area.

It will be the responsibility of this sub-committee to incorporate everyone's existing and future needs including the financial responsibilities of each party. If approved, this plan should be presented to the NC-DOT for possible additions to the U-2803 project.

CLOSING

An important part of any successful traffic and student loading operation is education. If the traffic and loading operations are altered, drivers should be informed before arriving on campus. This should be accomplished by using local media and school handouts that describe the traffic and loading operations and emphasizes the concern for student safety. Municipal and School Transportation Assistance will be available to assist with the final draft of this type of handout.

The recommendations and findings of this report should not be thought of as mandates for action. It is and will be the responsibility of Frank Porter Graham Elementary School and Orange County School System to implement and/or construct any of the recommendations located within their property boundaries. Any recommendations or improvements located within the Department of Transportation roadway right-of-way will require the consultation of the Division Engineer. If participation needs to be considered, the following factors will be taken into account before any action is taken: jurisdictional responsibility, availability of funds, and the priority placed on the improvements by the Department of Transportation relative to all other planned and programmed improvements in the area.

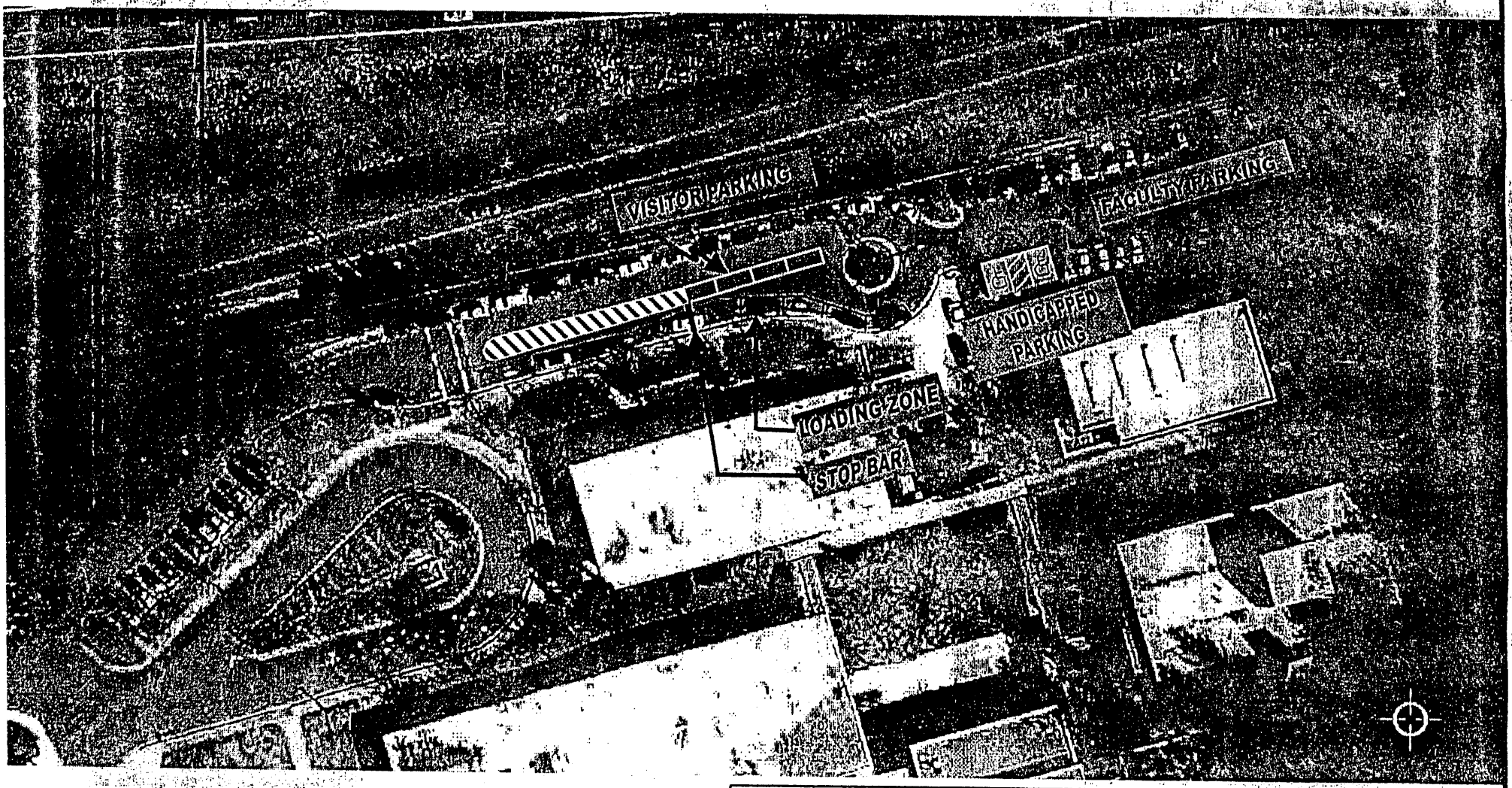
Thank you for the opportunity to serve Frank Porter Graham Elementary School and the Orange County School System. If further assistance is required, or if there are any questions regarding the provided information, please feel free to call me at (919) 250-4151, or by email at dstanley@dot.state.nc.us.

Sincerely,

David G. Stanley
Urban Project Engineer

Attachment

cc: Dr. Steven Green – Principal, Frank Porter Graham Elementary School
Julie Noel – Facilities Coordinator - Frank Porter Graham Child Development Center
Dale McKeel - Town of Carrboro
Calvin Horton – Town of Chapel Hill, Manager
T.A. Peoples, PE - State Traffic Engineer
J. M. Mills, PE - Division Engineer
(Attn. V. E. Barham - Division Traffic Engineer)
A. D. Wyatt, PE - Field Operations Engineer
(Attn. J. H. Grant, PE - Area Traffic Engineer)
T. M. Hopkins, PE - Traffic Congestion and Operations Engineer
(Attn. J. H. Dunlop, PE – Congestion Management Engineer)



CONCEPT PLAN
NOT FOR CONSTRUCTION

Municipal & School

Transportation

Figure 2
Frank Porter Graham Elementary School
Revised Student Loading Layout

DIVISION 07 | Orange County | In Carrboro

SCALE:	NONE	N. C. DEPARTMENT OF TRANSPORTATION	REVIEWED BY:
DATE:	01/30/02	DIVISION OF HIGHWAYS	REVISIONS:
PREPARED BY:	DGS	TRAFFIC ENGINEERING & SAFETY SYSTEMS BRANCH	