



**File No. NSD-L-99-24**  
**CC Docket No. 92-105**



Comments To:

**Federal Communications  
Commission**

By:

**James C. Codell, III**  
Secretary of Transportation  
Kentucky Transportation Cabinet  
501 High Street  
Frankfort, Kentucky 40622

*Please Confirm Receipt*  
**KENTUCKY TRANSPORTATION CABINET**

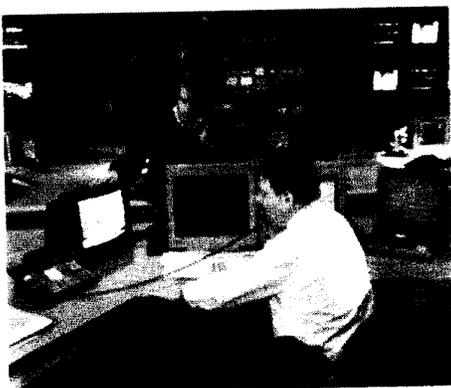
July 9, 1999



**R. Leon Walden, P.E.**  
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Frankfort, Kentucky 40622

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James C. Codell, III  
Secretary of Transportation

July 9, 1999

T. Kevin Flanery  
Deputy Secretary

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Ms. Magalie Roman Salas  
Commission Secretary  
Federal Communications Commission  
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Washington, D.C. 20554

Re: File No. NSD-L-99-24  
CC Docket No. 92-105

Dear Ms. Salas:

The Kentucky Transportation Cabinet (KYTC) is pleased to submit an original and four copies of comments supporting the U.S. Department of Transportation's petition for a National N-1-1 Dialing Code to be used to provide Advanced Traveler Information Services (ATIS). Two sets of our comments have been sent direct to Mr. Al McCloud.

Please be advised that the KYTC was the first transportation agency in the nation to obtain and use a N-1-1 dialing code for ATIS. On June 21, 1995, the Kentucky Public Service Commission (KPSC) awarded our Agency with 3-1-1 to use in the Cincinnati/Northern Kentucky area. Subsequent to FCC action on February 18, 1997, to reserve 3-1-1 for non-emergency local government calls, the KPSC changed our 3-1-1 dialing code to 2-1-1. We would like very much to both retain this number and to expand its usage to other portions of Kentucky.

There are many issues associated with the use of a N-1-1 Dialing Code. Our Agency has faced each one and they are not insurmountable. We strongly recommend designation of a National N-1-1-Dialing Code for traveler information.

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Ms. Magalie Roman Salas  
Page Two  
July 9, 1999

Our comments are detailed, lengthy, and based on our experiences while using 3-1-1 and 2-1-1. These comments are contained in the remainder of this notebook and are tabulated for your convenience in reviewing. Highlights of our comments are as follows:

- Concurrent usage of 3-1-1 in Kentucky and 333-3333 in Ohio over a three-month period involving a total of 67,924 landline calls showed a 72.7% greater usage of 3-1-1 on a per capita basis.
- Later usage of 2-1-1 in the entire Cincinnati/Northern Kentucky area compared to the three-month period in the above comment, showed an increase of 91%. Several months with major traffic crashes and construction starts had higher usage but were not used in calculating the 91% increase.
- Based on an independent, statistically valid survey of 2-1-1 users, 99% of these users stated that they benefited by the travel information obtained by calling 2-1-1.
- 65% of the 2-1-1 users noted above said they were willing to pay for the 2-1-1 service with the average amount stated as \$0.25 per call. Some users were willing to pay as much as \$3.00 per call.

Our comments clearly show that use of a N-1-1 Dialing Code results in more calls for traveler information when compared to an excellent seven-digit dialing code. However, the traveler information must also be accurate, current, and reliable. The KYTC and ODOT have committed the resources to provide the highest quality of traveler information. A continued use of 2-1-1 will increase the return on our investment to provide high quality traveler information that benefits the traveling public.

We are planning a visit to the FCC after August 20, 1999, to answer any questions which your staff may have and to explain our comments. Our group will be limited to six people, and we will schedule our visit with Ms. Helene Nankin of your Network Services Division.

Again, we greatly appreciate the opportunity to comment on the N-1-1 petition and strongly recommend your approval of a N-1-1 Dialing Code for Advanced Traveler Information Systems.

Sincerely,

  
James C. Codell, III  
Secretary

JCC/LW/dd

c: Kentucky Congressional Delegation  
John Collins, ITS America  
Gordon Procter, Ohio Department of Transportation  
James Q. Duane, OKI Regional Council of Governments  
Kentucky Public Service Commission

## **N-1-1 USAGE IN KENTUCKY**

- . KY Public Service Commission Administrative Actions
- . N-1-1 Call Data and Analyses
- . Accessing 2-1-1
- . Public Benefits of 2-1-1
- . Cost of Providing 2-1-1

## **N-1-1 USAGE IN KENTUCKY**

Kentucky was the first State in the nation in which a N-1-1 Dialing Code was used for providing traffic information to the public. A brief history follows:

On November 5, 1993, the Kentucky Public Service Commission (KPSC) issued Administrative Order 343 which denied the petition of a private sector company that had requested the KPSC to order local exchange carriers (LEC's) to assign a N-1-1 Dialing Code for its use. The KPSC declared in this Order that N-1-1 Dialing Codes were "a scarce public resource" and should be reserved for public purposes.

On April 13, 1995, the KPSC re-opened this Administrative Proceeding to hear a petition from the Kentucky Transportation Cabinet (KYTC) that a N-1-1 Dialing Code be assigned to provide traffic information to the public in the Kentucky portion of the service area of the LEC which serves the Cincinnati/Northern Kentucky area. On May 16, 1995, this formal hearing was held at which time the KYTC, the LEC, and other interested parties presented testimony on the KYTC petition. On June 21, 1995, the KPSC assigned 3-1-1 to the KYTC for the requested purpose of providing traffic information to the public. In the Official Order, the KPSC stated that the assignment met the standard of improving quality or quantity of service to the citizens of Kentucky.

On February 18, 1997, the Federal Communications Commission issued an Order which reserved 3-1-1 for "non-emergency local governmental usage". Subsequently, the KPSC assigned 2-1-1 to the KYTC for a period ending October 21, 1999. As such, 2-1-1 is currently used by residents of six Kentucky Counties to obtain traffic information. Also, the Ohio Department of Transportation (ODOT) has been assigned 2-1-1 by the Public Utilities Commission of Ohio (PUCO) for use in the Ohio portion of the LEC service area. This roughly coincides with the Cincinnati/Northern Kentucky Urbanized Area as defined by the U.S. Bureau of the Census. Copies of the three KPSC Orders are included under Tab 3.

The overall traffic information service provided by the KYTC and ODOT for the Cincinnati/Northern Kentucky area began June 28, 1995, using a seven-digit dialing code (333-3333). Although KYTC had been assigned 3-1-1, the dialing code was not placed into service until November 20, 1995, due to the period of time necessary to put a rate structure in place. ODOT also had filed a request on April 4, 1995, with PUCO for a N-1-1 Dialing Code, but this request was not acted upon until September 4, 1997. As such, there was a period of several months whereby Kentucky residents dialed 3-1-1 and Ohio residents dialed 333-3333 to access the jointly provided traffic information service. Therefore, the opportunity was available to collect concurrent usage data (discussed in the following sections) on both numbers.

The data collection period was February 13, 1997, through May 12, 1997. During this period, a total of 67,924 landline calls were made to the ARTIMIS Traffic Information Service provided by KYTC and ODOT. Kentucky residents made 18,509 or 27.25% of the calls to 3-1-1 whereas the remaining 49,415 (72.75%) were made by Ohio residents to 333-3333. As the LEC's service area did not coincide with US Census Tracts, a population estimate of the LEC's service area was prepared by the OKI Regional Council of Governments. This estimate indicated that 82.18% of this population resided in Ohio, and 17.18% resided in Kentucky. This information was used in a KYTC petition to the KPSC, filed August 13, 1997, which was the basis of assigning 2-1-1, as previously noted. Also, this data has been used in a Predictive Model to estimate the effect of a N-1-1 Dialing Code when compared to a seven-digit dialing code. This model is presented under Tab 2 and it estimates that use of a N-1-1 Dialing Code would increase the number of calls for traffic information in the Cincinnati/Northern Kentucky area by 72.7%.

### **USE OF 211 DIALING CODE IN KENTUCKY AND OHIO**

Eventually, in March of 1998, (there is no exact date due to transition), the LEC switched the ARTIMIS Traffic Information Service from 3-1-1 and 333-3333 to 2-1-1 for its entire service area. The number of landline calls quickly increased, with some months tripling over 1997-1998 call counts. However, only a portion of the increase can be attributed to the use of 2-1-1. Other factors included the overall maturity of the ARTIMIS Traffic Management Program, unusually bad weather in the spring of 1998, and initiation of three massive highway re-construction projects. However, if these conditions did not exist and the only variables were an area-wide switch to 2-1-1 and increased awareness of the information service, it is reasonable to expect an increase greater than the previously noted 72.7% increase due to a N-1-1 dialing code to account for the increased awareness. A bar graph chart of landline calls (shown under Tab 2 following the presentation of the Predictive Model) was prepared to visually identify anything that might tend to validate this premise. During the 20 months of April 1996, through November 1997, call counts were relatively stable, averaging 23,500. Over the next few months, call counts more than tripled reflecting severe winter weather, several major re-construction projects, and 2-1-1 being provided as the single dialing code for the area. In August of 1998, call counts tended to stabilize at the 44,900 level. Roughly, this is a 91% increase due to 2-1-1 and increased system awareness. While these percentages apply to the Cincinnati/Northern Kentucky area, they are not necessarily indicative of similar percentages in other areas. However, both premises validate a large increase in usage of the ARTIMIS Traffic Information Service due solely to the presence of a N-1-1 Dialing Code.

### **WHY IS THERE A LARGE INCREASE IN THE NUMBER OF N-1-1 CALLS?**

In 1997, when the KYTC was preparing a petition to the KPSC to switch from 3-1-1 to 2-1-1, we enlisted the assistance of two experts from the University of Kentucky to assist us in answering the above question. First of all, we needed an independent analysis of the statistical data. Secondly, we needed an explanation as to why the large percentage increase in calls could be expected. We did not, of course, have access at that time to 1998 and 1999 call data which gave a 91% increase in calls due to 2-1-1 and system usage.

Dr. Richard J. Kryscio, Director of the Biostatistics Consulting Unit at the University of Kentucky performed a statistical analysis of the above data. The Null Hypothesis was "the percentage of landline calls to the LEC due to the 311 Dialing Code equals the percentage of the urban population in the greater Cincinnati area living in Kentucky". He found the Z statistic for testing the null hypothesis to be 54.78 and the resultant two-tailed P value to be <0.0000001. As such, he rejected the null hypothesis. Simply put, Dr. Kryscio found that the number of calls made by Kentucky residents to 311 was much greater on a per capita basis than the calls made by Ohio residents to 333-3333.

Dr. Kryscio's statistical analysis was then sent to Frederick A. Schmidt, Ph.D., and Co-Director of the University of Kentucky College of Medicine's Memory Disorders Clinic for a Memory Process Analysis. Dr. Schmidt summarized his response, as follows:

"Based on the brief and extremely simplified view of memory processes presented above, we can now turn to the question of the relevance of these memory processes to the use of the 311 dialing code for information about traffic conditions. First, this number is brief and readily fits into the short-term or working memory (thereby reducing mental effort). Second, the sequence is short enough that people can readily dial it without losing this number and sequence (it is shorter than the human memory span of 5 to 9 digits), and third, it readily fits with information that is well learned by most persons (e.g., 911 code for emergencies) which should further enhance its memorability. Further, a longer string of digits such as the landline number used at the present time, even though it uses the same digit repeated seven times, may exceed the memory capacity of some persons, may interfere with attentional processes as this is dialed, and does not appear to readily fit with the 'mental set' or representation of telephone numbers that persons may dial on a routine basis. However, a discussion of the length of the dialing code and its potential impact on divided attention is perhaps best discussed as a human factors issue".

Dr. Schmidt's full report is included under Tab 4.

#### **SATISFACTION SURVEY OF N-1-1 USERS**

As has been previously shown. The use of a N-1-1 Dialing Code results in many more calls for traveler information. In order to maintain a high volume of calls, there must be accurate, current and reliable information provided. The KYTC and ODOT have committed the resources, including payment of the cost of 2-1-1, to provide the highest level of quality traveler information. This commitment is discussed in more detail in a later section.

Provision of an N-1-1 dialing code is expensive. Currently, the KYTC and ODOT pay about \$0.25 for each landline 2-1-1 call in the Cincinnati/Northern Kentucky area. An independent study of 2-1-1 usage was performed by the University of Kentucky to quantify benefits and determine the level of user satisfaction. A copy of the study report is included in this submission under Tab 5. Major findings and conclusions that relate to N-1-1 are as follows:

- 99% of users stated that they benefited by the traveler information obtained from calling 2-1-1.
- Users rated the ease to access traveler information by dialing 2-1-1 very high.
- 65% of users said they were willing to pay for 2-1-1 service with \$0.25 per call being the average amount they were willing to pay.
- Some users were willing to pay as much as \$3.00 per 2-1-1 call.
- Users made an average of 19 trips annually to other cities where they needed traveler information and would have used 2-1-1, if available.
- Users also made an average of 19 trips per year in rural areas where they needed traveler information and would have liked an easy to use, known, national number to call.
- 80% of users stated they would benefit from a national N-1-1 dialing code as they would not have to know local numbers.

#### **ACCESSING THE 2-1-1 DIALING CODE IN KENTUCKY AND OHIO**

The 2-1-1 dialing code can only be accessed by landline callers in the service area of the Local Exchange Carrier (LEC). This area includes six Kentucky Counties and most of the Cincinnati urbanized area in Ohio. Also, a few hundred customers of the LEC reside in Indiana. A map showing the LEC service area is provided under Tab 2.

Originally, all calls were made to 333-3333. This number has been retained by the LEC as the primary dialing code. Anyone in the LEC service area can still dial this number. Anyone outside the LEC service area must add the 513 area code. Landline callers in the LEC's service area may also dial 3-1-1 as the LEC has not discontinued use of this number.

Cellular callers, through arrangement with cellular providers, also dial 2-1-1 but their service area is determined by the providers. While these areas vary, they approximate the LEC's service area. The two major cellular providers waive air-time charges for calls to 2-1-1 as a public service. Two other providers are considering provision of a similar public service. Cellular callers may also dial 333-3333 but are subject to air-time and possibly roaming charges.

## **PUBLIC BENEFITS OF USING A 2-1-1 DIALING CODE FOR TRAVELER INFORMATION**

A prerequisite for public benefits in using 2-1-1 for traveler information is that there must be current, reliable and useful information available. The KYTC, ODOT and the OKI Regional Council of Governments are providing information that meets these criteria. This information includes traffic conditions, construction information and transit information. The user satisfaction survey report (Tab 5) states that 99% of landline 2-1-1 users reported that they benefited by accessing the traveler information and then changing travel routes, departure times (or both), destination, etc.

We have previously shown that the original use of 3-1-1 in Kentucky leads to an expectation of a 72.7% increase in calls in the Ohio portion of the LEC's service area as compared to a seven-digit number. During the period from late November of 1995 to March of 1998, literally thousands of Ohio travelers were deprived of benefits enjoyed by Kentucky travelers as far as being able to modify their travel due to crashes, construction, etc.

## **COST OF PROVIDING 2-1-1 IN THE CINCINNATI/NORTHERN KENTUCKY AREA**

On December 21, 1994, the KYTC and ODOT made a commitment to provide the highest quality traveler information possible in the Cincinnati/Northern Kentucky Urbanized Area. Funds have already been obligated to provide this information through September 30, 2000. We anticipate that this commitment will be extended prior to that date for an additional period of time.

We estimate that as of September 30, 2000, we will have expended \$7,150,000 as a result of this commitment. The cost of providing 2-1-1 alone is estimated to be \$750,000 with the traveler information itself costing \$6,400,000.

The \$7,150,000 is composed of \$6,750,000 in Federal Congestion Mitigation Air Quality (CMAQ) funds from the Federal Highway Administration and \$400,000 in matching funds provided by this Agency.

- Predictive Model of 2-1-1 Usage
- ARTIMIS Landline Call Counts and  
N-1-1 Dialing Code Time-Lines
- Local Exchange Carrier Operating Area

## PREDICTIVE MODEL FOR N-1-1 USAGE IN THE CINCINNATI/NORTHERN KENTUCKY AREA

### Data for Model:

Time Frame	February 13, 1997 to May 12, 1997
3-1-1 landline calls in Kentucky	18,509
333-3333 landline calls in Ohio	49,415
Total landline calls in LEC service area	67,924
Estimated 1997 Kentucky Population	344,000
Estimated 1997 Ohio Population	1,586,000

NOTE: The population estimates are for the LEC's service area and do not conform to Bureau of Census tracts.

### Theory of Predictive Model:

The "Expected" N-1-1 calls in the Ohio portion of the LEC's service area has the same ratio to the population of this area as the actual N-1-1 calls in the Kentucky portion of the LEC's service area has to the Kentucky population.

### Calculations:

$$\frac{\text{Expected N-1-1 calls in Ohio}}{\text{Ohio Population}} = \frac{\text{3-1-1 calls in Kentucky}}{\text{Kentucky Population}}$$

$$\frac{\text{Expected N-1-1 calls in Ohio}}{1,586,000} = \frac{18,509}{344,000}$$

$$\text{Expected N-1-1 calls in Ohio} = \frac{18,509 \times 1,586,000}{344,000}$$

$$\text{Expected N-1-1 calls in Ohio} = 18,509 \times 4.6105$$

$$\text{Expected N-1-1 calls in Ohio} = 85,335$$

$$\% \text{ Increase} = \frac{\text{Expected N-1-1 calls in Ohio} - \text{Actual 333-3333 calls in Ohio}}{\text{Actual 333-3333 calls in Ohio}}$$

$$\% \text{ Increase} = \frac{85,335 - 49,415}{49,415}$$

$$\% \text{ increase} = 72.7\%$$

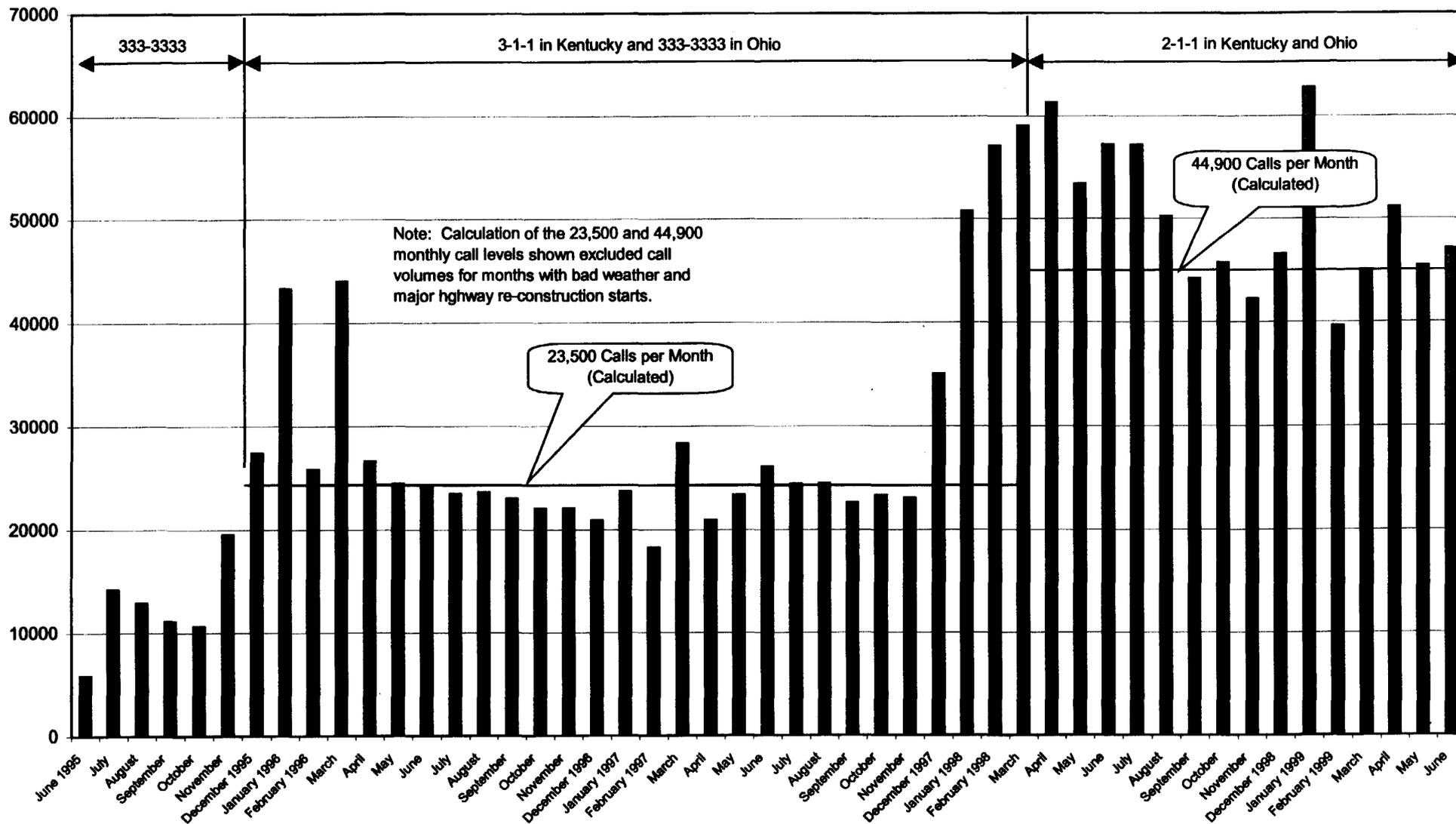
### Conclusion:

During the period February 13, 1997 through May 12, 1997, there would have been 72.7% more landline calls in Ohio for traffic information had the dialing code been 3-1-1 instead of 333-3333. Likewise, it is concluded that 72.7% of the 18,509 calls in Kentucky were due to the availability of 3-1-1.

# ARTIMIS Landline Calls and N-1-1 Dialing Code Time-Line

June 1995 through June 1999

[With comparison between use of 3-1-1 (Kentucky) and 333-3333 (Ohio) with 2-1-1]



LOCAL EXCHANGE CARRIER OPERATING AREA



June 9, 1992

**Kentucky Public Service Commission N-1-1 Orders**

- . November 5, 1993
- . June 21, 1995
- . November 14, 1997



## BACKGROUND

N11 service is a three-digit dialing arrangement and consists of the numbers 211 through 911, inclusive. The 411 and 911 numbers are traditionally used by LECs to provide services such as directory assistance and emergency service. In some cases 611 and 811 may also be used by LECs to provide services such as TDD and repair. As a result the quantity of N11 numbers available for assignment to other services including commercial ventures is severely limited.

On March 6, 1992, BellSouth Telecommunications, Inc. ("BellSouth"), in response to a request for assignment of a three-digit dialing arrangement, filed a petition asking the Federal Communications Commission ("FCC") for a declaration that the use of N11 codes to obtain access to local pay-per-call information services is consistent with the Communications Act and FCC policies. On May 6, 1992, a Notice of Proposed Rulemaking ("NPRM") was released by the FCC.<sup>1</sup> The NPRM tentatively concluded the FCC should adopt rules to govern the use of certain N11 codes and invited comments. At the same time the FCC's General Counsel informed BellSouth that no regulatory or legal impediment prohibited BellSouth from assigning N11 codes in a reasonable, nondiscriminatory manner. However, he cautioned that the assignment was subject to the FCC proceeding and that parties

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<sup>1</sup> The Use of N11 Codes and Other 92-105 Abbreviated Dialing Arrangements, Notice of Proposed Rulemaking, CC Docket No. 92-105, 7FCCRC10 (1992).

accepting number assignments would do so at their own risk. As a part of the NPRM, the FCC stated that 411 and 911 should continue to be reserved for directory assistance and emergency services; that 211, 311, 511, 711 should be available for commercial use; and that 611 and 811 should also be available where not otherwise assigned. Subsequently, BellSouth N11 tariff filings in Florida and Georgia were accepted on a trial basis to obtain information relating to practical experience with N11 service. Neither the FCC proceeding nor the trials have been completed at this time.

The petitions raise the following issues:

1. a. Does the Commission have jurisdiction over N11 dialing codes and therefore have authority to order LECs to allocate them?

b. If authority does exist, should the Commission proceed or hold the petitions in abeyance until the conclusion of the FCC's investigation?

2. If the Commission chooses to proceed, is allocation of N11 dialing codes in the public interest? The public interest issue is framed in the context of promoting competition in the telecommunications industry. Should scarce, public resources be available for private commercial ventures?

3. If found to be in the public interest, how should N11 dialing codes be allocated and should LECs be ordered or permitted to allocate N11 codes?

## DISCUSSION

None of the parties to this proceeding dispute the opinion set forth by FCC counsel or the Commission's authority to order allocation of N11 dialing arrangements.<sup>2</sup>

The Commission finds that it has jurisdiction over the assignment of N11 dialing codes and based upon this finding will proceed to consider issues relating to allocation.

### FCC Investigation

Infodial's witness testified that the Commission should not delay action until the FCC decides the issues in its rulemaking.

[t]he N11 Rulemaking is unlikely to render this proceeding moot. If the FCC adopts its rules as proposed and mandates the availability of N11 codes, then this proceeding still will be necessary in order to determine the terms and conditions under which they are offered for intrastate service. If the FCC adopts no rules, then this proceeding will be necessary in order to determine whether the Commission on its own authority should require LECs to offer N11 service.<sup>3</sup>

BellSouth Telecommunications, Inc., d/b/a South Central Bell Telephone Company ("South Central Bell") concurs but AT&T Communications of the South Central States, Inc. ("AT&T") recommends holding the petition in abeyance in order to avoid duplication of efforts by the parties.

Some overlapping of decisions made in this proceeding and those reached at the federal level may occur. However, it is clear that this proceeding and some of the issues presented here will

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<sup>2</sup> NPRM, Supra.

<sup>3</sup> Pre-filed Testimony of Richard S. Bell, at page 9.

have to be addressed regardless of the outcome of the FCC proceeding. Therefore, the Commission will proceed to consider other issues raised in this proceeding.

#### Public Interest Issues

There is a general consensus among the parties that N11 numbers are a scarce public resource, that alternative dialing arrangements currently allow information providers to make their services available to Kentucky consumers, that approval of Infodial's petition will result in demand exceeding supply, and that N11 dialing arrangements are easy to use and remember. However, this consensus is used to support the arguments of the parties in different ways.

Infodial asserts that N11 numbers will give consumers quick, easily remembered access and make it convenient for consumers to reach and use information services. Infodial submits that knowing how to obtain access to information is almost as important as the information itself. Consumers will easily remember that N11 means information.

However, Infodial does not concede that allocating N11 dialing codes to a few information providers will confer any competitive advantage on those entities receiving the numbers. The company urges the Commission to allocate the codes on a "first-come, first-serve" basis. While acknowledging that all allocation methods including "first-come, first-serve," lottery or auction, are subject to shortcomings, Infodial argues that its method would reward entities with the foresight to file petitions. Further,

Infodial finds alternative dialing arrangements for the provision of information services unsavory and expensive.

South Central Bell generally supports Infodial's petition but requests that the Commission authorize rather than mandate allocation of N11 codes. It also notes that N11 numbering will be expanded in approximately 2 to 3 years resulting in a significant increase in abbreviated dialing arrangements.

All companies opposing the petition agree that entities which do not receive abbreviated dialing codes will be competitively disadvantaged. Also, because N11 dialing codes are scarce, assigning the codes may deny the public potentially more useful applications of this resource. For instance, US Sprint Communications Company ("Sprint") comments that "the Commission is faced with the prospect of conferring a competitive advantage upon a few select companies thereby impeding rather than stimulating the development of a competitive information services market in Kentucky."<sup>4</sup> AT&T opines that "the resulting unavailability of equally competitive dialing arrangements would present significant disincentives for entry by new competitors into the enhanced services market."<sup>5</sup> MCI Telecommunications Corporation ("MCI") comments that "it would be an injudicious and unnecessary step to award scarce N11 codes while other marketable alternatives are

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<sup>4</sup> Sprint, written comments filed February 12, 1993, at page 3.

<sup>5</sup> AT&T, Post-Hearing Brief, at page 3.

available."<sup>6</sup> Finally, Cincinnati Bell Telephone Company ("CBT") states that "although Infodial casts its request in terms of satisfying the public interest, in reality the request is merely to permit Infodial to realize private gain, while at the same time allowing the dissipation of a scarce public resource."<sup>7</sup>

The Lexington Herald-Leader frames its position in the context of its own situation vis-a-vis the Louisville Courier-Journal. Some circulation areas of the two newspapers overlap and there is keen competition for subscribers. With regard to LECs, the Courier-Journal is headquartered in South Central Bell's territory and the Herald-Leader in GTE South Incorporated and Contel of Kentucky, Inc. d/b/a GTE Kentucky's ("GTE") territory. The Herald-Leader is concerned that the Courier-Journal might have an N11 number and it would not, thereby putting it at a competitive disadvantage in those overlapping circulation areas.

The National Center for Law and Deafness ("NCLD") and Telecommunications for the Deaf, Inc. ("TDI") also filed comments in opposition to the assignment of N11 dialing codes to commercial information service providers pending the outcome of the FCC ruling.<sup>8</sup>

N11 dialing arrangements are obviously easier to remember and easier to use than existing alternative dialing arrangements. Any

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<sup>6</sup> MCI, written comments filed February 11, 1993, at page 5.

<sup>7</sup> CBT, written comments filed February 11, 1993, at page 3.

<sup>8</sup> NCLD and TDI, written comments filed October 7, 1993.

customer wishing to obtain access to any service would choose to dial 3 digits in lieu of 7 or more. This clearly presents an opportunity for those few entities which receive an N11 dialing code to gain a significant competitive advantage. The Commission encourages information services such as those provided by information service providers. However, they are currently available to the citizens of Kentucky through alternative dialing arrangements. The Commission also supports the development of viable, sustainable competition in the information service market in Kentucky. In this case that means ensuring a level playing field so that the only impediment to the success of information service providers is their own ingenuity, not regulatory barriers to entry. Allocating N11 dialing codes will not provide the citizens of Kentucky with improved quality or quantity of service and in the long run will have a negative effect on the development of the information services market. Therefore, the Commission finds that allocation of N11 dialing codes is not in the best interests of Kentucky telephone users or information service providers.

N11 is a scarce public resource. It is used by LECs to provide valuable and in some instances, critical services to the public. It is not unreasonable to believe that public needs for N11 dialing codes will increase. Therefore it would not be prudent for the Commission to allow private enterprises to exhaust this scarce public asset for private interest.

Alternative dialing arrangements are currently available through which information service providers can offer their services. In the near future, new dialing plans will result in the availability of a plethora of new abbreviated dialing arrangements. Ordering the allocation of N11 dialing codes or allowing LECs to file tariffs offering the service are not in the public interest at this time.

IT IS HEREBY ORDERED that:

1. The petitions of Infodial, American, and Phoneformation requesting the Commission to order LECs to assign abbreviated N11 dialing codes are denied.

2. The provisions of this Order shall not be construed as authorization for LECs to offer N11 dialing codes as a tariffed service.

Done at Frankfort, Kentucky, this 5th day of November, 1993.

By the Commission

ATTEST:

Susan Hutchison  
Admin. Section Supervisor

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

INVESTIGATION INTO THE ASSIGNMENT OF ) ADMINISTRATIVE  
ABBREVIATED N11 DIALING CODES ) CASE NO. 343

O R D E R

Pursuant to an April 13, 1995 request by the Kentucky Transportation Cabinet ("KYTC"), the Commission has reopened this proceeding.<sup>1</sup> On November 5, 1993, the Commission entered an Order denying the petitions of certain entities that had requested the Commission to order local exchange carriers to assign N11 dialing codes to them. The Commission decided that allocation of the numbers was not in the best interest of Kentucky telephone users or information service providers because allocating N11 dialing codes would not provide the citizens of Kentucky with improved quality or quantity of service and in the long run would have a negative impact on the development of the information services market.<sup>2</sup> The Commission noted that it would not be prudent to allow private enterprises to exhaust this scarce public asset for private interest.<sup>3</sup>

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<sup>1</sup> KYTC is responsible for implementing a traffic management project in the Cincinnati-Northern Kentucky area. In its request, KYTC asked the Commission to order the assignment of an N11 dialing code, "311," for the project, which is patterned after a telephone information system in Boston. KYTC asserts that the Boston system is weakened by the use of a seven-digit dialing code. Because KYTC seeks to provide the best system possible, it is seeking the assignment of "311."

<sup>2</sup> Order dated November 5, 1993 at page 8.

<sup>3</sup> Id.

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Based upon the assertions of KYTC that the service would be valuable to the public and would be generally available and not a mere commercial venture on the part of the information provider, the Commission reopened this proceeding for reconsideration of its Order as applied to public service projects. The sole issue is whether Cincinnati Bell Telephone Company ("Cincinnati Bell") should be ordered to allocate an N11 number to KYTC for its "public service project" called ARTIMIS ("Advanced Regional Traffic Interactive Management Information System").

ARTIMIS is a state-of-the-art traffic management system that relies on the latest technology to provide "real-time" information to motorists. The system is the first of its kind in this part of the United States and will provide a unique traffic operations program in the most congested roadway network in the region.

The project is a partnership between KYTC, the Ohio Department of Transportation ("ODOT"), the Federal Highway Administration ("FHWA"), the Ohio-Kentucky-Indiana Regional Council of Governments ("OKI"), and the city of Cincinnati. The system is designed to provide the Cincinnati-Northern Kentucky Metropolitan Area with accurate up-to-the-minute traffic information to the public, relieve traffic congestion, and improve air quality.

The purpose of ARTIMIS is to provide a centralized system for effective incident detection and management of the freeway system in the Cincinnati-Northern Kentucky area. The primary geographic focus of the ARTIMIS operation is 88 miles of interstate highways and state freeways in the Metropolitan Area.

Beginning June 28, 1995, travelers in the Cincinnati-Northern Kentucky area can dial the temporary SmartRoute Control Center, follow the prompts and receive information on the highway segments that they plan to travel. On October 1, 1996, an extensive network of system monitors and procedures will be in place making it possible to monitor traffic, identify traffic congestion and its cause, provide alternative route information, and take quick corrective action to clear up the congestion.

SmartRoute will eventually transfer its operations into a permanent Control Center. After the transfer, it will have a much more sophisticated and extensive information database for use in providing travel information to callers. Data from an independent evaluation of the SmartRoute Systems shows that its service has the ability to enhance significantly KYTC and ODOT efforts to reduce congestion, to increase mobility, to reduce air pollution, and to improve safety on the highways.

According to KYTC, one of the key components of this system is the ability to use an abbreviated N11 telephone number for simplicity and speed. Three-digit dialing arrangements are easier to remember and use than existing alternative dialing arrangements. However, N11 is a scarce public resource. Consequently, the Commission will not order the allocation of such numbers unless it determines that doing so is in the best interest of Kentucky telephone users or information service providers.

KYTC's determination that road systems need to be improved by using technology instead of construction, concrete and steel, makes

it clear that after implementation of the system, citizens of Kentucky will be provided with improved quality and quantity of service. None of the parties in this proceeding dispute these facts. Their dispute centers around the allocation of an N11 number to KYTC for this project.

Cincinnati Bell states that an N11 number should not be assigned to KYTC because there are policy differences that need to be decided at the federal level. It states that because Cincinnati Bell operates in various jurisdictions--Ohio, Indiana, Kentucky and federal--that it would be better served by a federal ruling.

South Central Bell states that KYTC's goal of achieving national uniformity in the use of an N11 code cannot be reached until the arrival of the next generation of abbreviated dialing, which is approximately 2-3 years away. The next generation will expand the N11 numbering and, thereby, eliminate the current N11 scarcity problem.

KYTC's responded that 1) N11 dialing codes can be introduced to the public at less cost, 2) tourists will have less difficulty when visiting the area, and 3) barriers to usage are reduced because the codes can provide highly mnemonic and universally understood access to travel information. Furthermore, KYTC states that such numbers imply public responsibility or publicly accountable and highly useful information. In addition, they convey public sponsorship and benefit.

Allocation of N11 numbers is in the best interest of Kentucky when it provides citizens of Kentucky with improved quality or

quantity of service. While this project will not serve all the citizens of Kentucky, the public purpose is significant enough that KYTC's project meets this standard and should be approved on an experimental or trial basis. Further, it should be clearly understood that KYTC's use of N11 dialing code "311" shall be strictly limited to the "public service project" called ARTIMIS.

The Commission, being otherwise sufficiently advised, HEREBY ORDERS that:

1. Cincinnati Bell shall assign KYTC an N11 dialing code, "311," for a period of two years, beginning the date of this Order.
2. KYTC's use of N11 dialing code "311" shall be strictly limited to the "public service project" called ARTIMIS.
3. At the end of the two-year period, the Commission will review the purpose and uses made by KYTC and decide whether it should be allowed to retain "311" beyond the initial two-year period.
4. Within 20 days of the date of this Order, Cincinnati Bell shall file a proposed tariff containing the rates and conditions of service for the N11 dialing code.

Done at Frankfort, Kentucky, this 21st day of June, 1995.

By the Commission

ATTEST:

  
\_\_\_\_\_  
Executive Director

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

INVESTIGATION INTO THE ASSIGNMENT ) ADMINISTRATIVE  
OF ABBREVIATED N11 DIALING CODES ) CASE NO. 343

O R D E R

On June 21, 1995, the Commission required Cincinnati Bell Telephone Company ("Cincinnati Bell") to allocate 311 to the Kentucky Transportation Cabinet ("Transportation Cabinet") for its public service project entitled Advanced Regional Traffic Interactive Management Information System ("ARTIMIS"). The Commission determined that the allocation of 311 was in the best interest of Kentucky telephone users and ordered the assignment of 311 for a period of two years. The Transportation Cabinet requested and was granted an extension of the trial period for the 311 dialing code. Because the Federal Communications Commission ("FCC") has allocated the 311 dialing code on a nationwide basis for non-emergency police calls, the Transportation Cabinet is requesting the 211 dialing code be assigned to it.

On August 13, 1997, the Transportation Cabinet filed extensive information regarding Traveler Telephone Information in Northern Kentucky. The Transportation Cabinet has requested that it be awarded the use of the 211 dialing code on a permanent basis to provide Telephone Traveler Information in the Kentucky portion of the Cincinnati Bell service area. Moreover, the Kentucky Transportation Cabinet requested the Commission enjoin Cincinnati Bell from assessing a business opportunity fee for the provision of the dialing code.

Cincinnati Bell has requested the establishment of a procedural schedule with discovery in December and a hearing scheduled for the first quarter of 1998. Cincinnati Bell is willing for the trial period to be extended while these issues are resolved. However, the Ohio Public Utilities Commission awarded the 211 dialing code to the Ohio Transportation Cabinet for a two-year trial period.<sup>1</sup>

The Commission finds, after considering all filed information, that Cincinnati Bell should provide the 211 dialing code to the Kentucky Transportation Cabinet for the Traveler Telephone Information for a two-year trial period in conjunction with the Ohio Public Utilities Commission Order. Moreover, there should be an informal conference to discuss all issues related to the business opportunity fee assessed by Cincinnati Bell for the use of the dialing code.

IT IS THEREFORE ORDERED that:

1. The trial for the N11 dialing code for Traveler Telephone Information in Northern Kentucky shall be extended to October 31, 1999.
2. The Transportation Cabinet shall be assigned the 211 dialing code for the trial period rather than the 311 dialing code.
3. An informal conference shall be held on Tuesday, December 2, 1997 at 10:00 a.m., Eastern Standard Time, in Conference Room 1 of the Commission's offices at 730 Schenkel Lane, Frankfort, Kentucky.

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<sup>1</sup> Case No. 93-1799-TP-COI, In the Matter of the Commission Investigation Into the Allocation of Abbreviated Dialing Arrangements, Such as N-1-1, Opinion and Order (September 4, 1997, at 16).

Done at Frankfort, Kentucky, this 17th day of November, 1997.

PUBLIC SERVICE COMMISSION

B. J. Nettles  
Chairman

[Signature]  
Vice Chairman

[Signature]  
Commissioner

ATTEST:

[Signature]  
Executive Director

Memory Processes Report By  
Frederick A. Schmitt, PHD

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August 7, 1997

Mr. Leon Walden, P.E.  
Division of Multimodal Programs  
Kentucky Transportation Cabinet  
125 Holmes Street  
Frankfort, KY 40622

Dear Mr. Walden:

Attached is a brief analysis of human memory systems designed to give an elementary (and hopefully not too pedantic) summary of how memory appears to work and its relevance to the question of the applicability of a 311 dialing code versus a 333-3333 code for obtaining traffic information from the ARTIMIS system.

I hope that the presentation is not too elementary for the members of the Kentucky Transportation Cabinet and that my opinion concerning the mental or memory load of each of these dialing codes is straightforward based on what we know about human memory processes. Please also note that I have avoided discussing these dialing codes in terms of human factors (such as divided attention) which might also be relevant to your presentations to the Kentucky and Ohio Public Service Commissions.

Please feel free to call me or e-mail me ([fas\\_com@coa.uky.edu](mailto:fas_com@coa.uky.edu)) if you have any questions about my analysis based on memory processes.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. A. Schmitt'. The signature is fluid and cursive, with the first name 'F.' and last name 'Schmitt' clearly visible.

Frederick A. Schmitt, Ph.D., Associate Professor of  
Neurology, Psychiatry, & Psychology  
Co-director, Memory Disorders Clinic

Enclosure

cc. Mr. Jerry Pigman, P.E.

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ARTIMIS – Memory Components

This summary of human memory processes, capacities and limitations is designed to provide a basic understanding of memory and how memory may impact on information from the ARTIMIS program.

Basic memory systems. While there are a wide variety of terms used to describe memory processes, one simple taxonomy of the memory system uses a tripartite model to describe memory stores and processes. In the groundbreaking model of Atkinson and Shiffrin (1968), memory is conceptualized as a series of processes including selective attention, short-term storage, and long-term storage that, in conjunction with mental processes such as rehearsal of information, comprise an information processing system for learning and retention of information. A 'clinical' model of these processes and memory stores is outlined below:

- *Immediate Memory* - is linked to attention and describes the time limited retention span of objects, events, or information that enters the memory system. If no additional mental processes are engaged to work with this information, this material is rapidly lost from memory (In a few seconds – short-term memory);
- *Recent Memory* - is conceptualized as a temporary holding area or mental process for information that may be stored in a more permanent fashion (akin to Atkinson & Shiffrin's short-term memory with a 'rehearsal loop') [note that immediate and recent memory are similar to the concept of 'Working Memory'] and therefore refers to the ability to accomplish new learning;
- *Remote Memory* - is conceptualized as the permanent aspect of the memory system (long term memory) where information is stored for use over a long period of time.

Each of these memory systems can be discretely tested using both experimental and clinical methods. Further, each of these memory processes has specific limitations in terms of the amount of information that can be processed, the length of time that information can exist in each specific process or system, and there are data from animal and human studies that suggest that these processes are supported by specific brain regions to varying degrees. In brief, the capacity, duration, the impact of competing information, and examples are summarized in the following Table:

Human Memory Processes

	<u>Immediate Memory</u>	<u>Recent Memory</u>	<u>Remote Memory</u>
<i>Capacity:</i>	Limited (span of 7±2 items)	Large	Possibly unlimited
<i>Duration:</i>	seconds	minutes to years	Possibly forever
<i>Effect of Distraction:</i>	labile, competing information accelerates loss of information	labile, competing information interferes with storage & retrieval	stable
<i>Example:</i>	hearing a telephone number and dialing it immediately	hearing a phone number and repeating it until you reach a phone to dial it	dialing well known numbers (home, work, etc.)

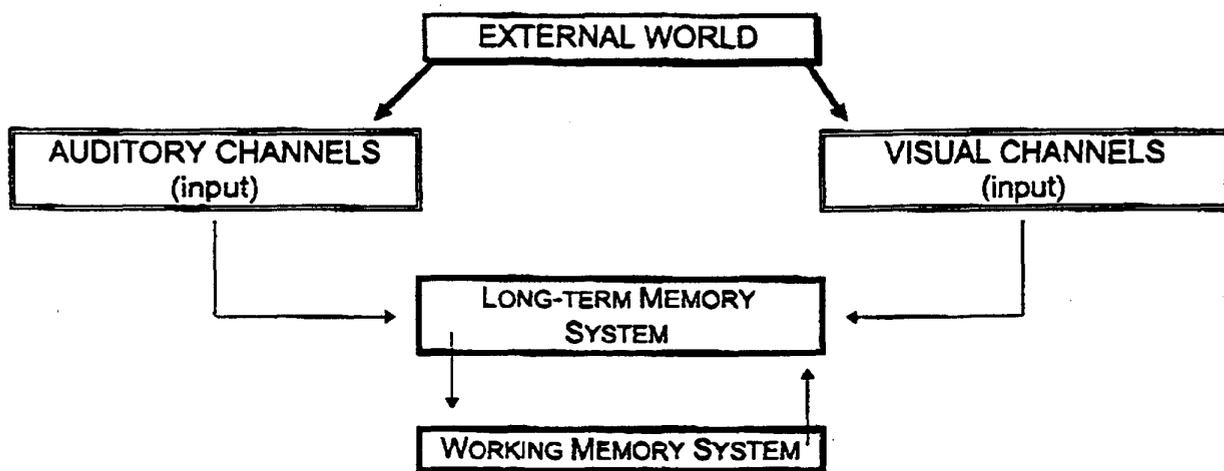
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Memory system interactions. Models of memory functioning have been developed to describe many aspects of human thought and action including complex problem solving and selective attention. In general, these models assume that information from the outside world is evaluated by information resident in a person's long-term memory or knowledge base. In other words, thinking is a manipulation of an internal memory or representation of the external world (environment). These assumptions allow us to extend the model of memory systems beyond thoughts to actions.

By assuming that memory systems interact with one another, we can diagram the flow of information between the outside world and two basic memory systems: working memory and long-term memory. This system is diagrammed below (Hunt, 1986):



Working memory is the system that holds information about the present situation while the long-term memory system holds information about the past. Memory processes (arrows) transfer information between the systems and can be conceptualized as rules and information about particular situations. An example of how this system might apply in a driving situation when approaching an intersection with a traffic signal is detailed as follows (Hunt, 1986):

<u>Possible Situations</u>	<u>Actions Taken</u>
Light is green	Drive through intersection
Light is yellow - Car is close to intersection	Drive through <i>rapidly</i>
Light is yellow - Car is far from intersection - No reason to hurry	Decelerate for stop
Light is yellow - Car is far from intersection - In a hurry	Accelerate while checking for other vehicles
Light is red - No reason to hurry	Stop
Light is red - Cars crossing intersection	Stop
Light is red - In a hurry	Check for other cars
Light is red - In a hurry - No other cars	Drive through intersection

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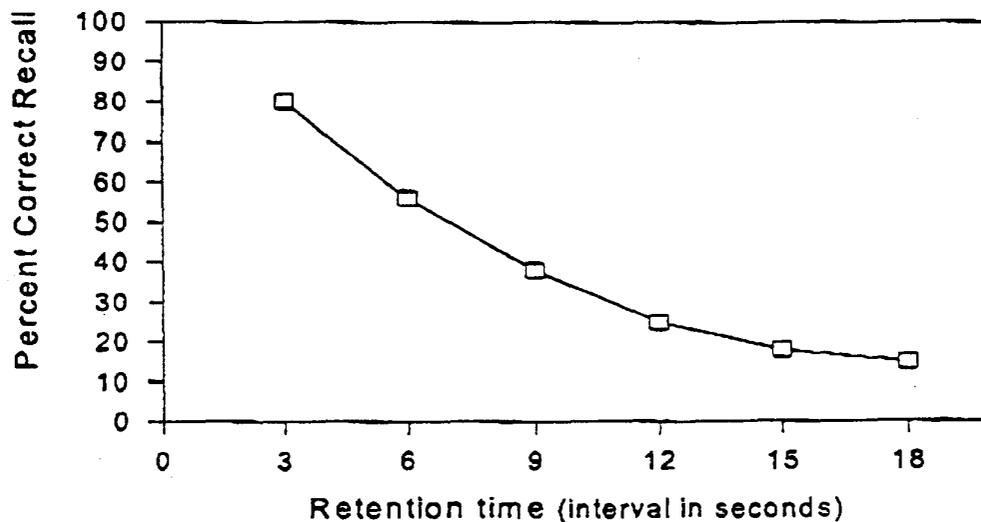
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In the above example, the current situation is being evaluated by an interaction between the working and long-term memory systems. Working memory holds the information about the color of the traffic signal, the need to rush, and the presence or absence of other vehicles (particularly police vehicles). Long-term memory provides rules about driving, the meaning of the signals, and consequences of the action taken along with the reason for the rush. At the same time, the contents of working memory are constantly being examined and updated by the long-term memory system. The whole thinking process is susceptible to distraction and competing information (for example a passenger who is talking to the driver) that can degrade the speed and capacity with which this system operates.

Relevant learning/memory functions. The final part of the puzzle that is relevant to the present arguments comes from research on how information is learned and how it is recalled. Research has, for several decades, investigated the capacity, input and output of the human memory system. Rather than detail all of this work, three aspects of memory will be highlighted.

First, experiments with lists of information of to-be-remembered (TBR) information (e.g., words, numbers, pictures) have shown that memory functions in a predictable way. Short-term recall of information has been studied in many experiments, however, for the present summary the classical paradigm of Peterson and Peterson best demonstrates the effects of time on information stored in short-term memory. Essentially this procedure has a person learn and remember a group of three items such as letters or numbers. After hearing or seeing the three items, the person is distracted (usually by doing mental arithmetic) and then memory for these three items is tested at preset times. As shown below, after memory for items was tested repeatedly across different time intervals, an extremely rapid rate of forgetting (that is almost complete after 18 seconds have elapsed) can be demonstrated.

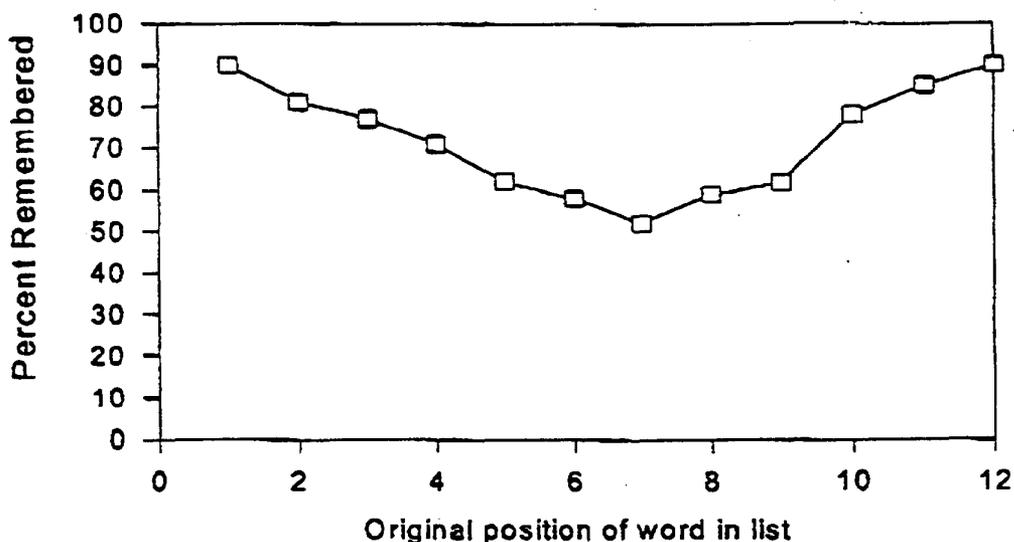


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The second important finding from research on human memory is the serial position effect. In essence, when given a list of words to remember in any order, people will learn these words and remember them in a particular fashion. For example, with repeated learning attempts, people tend to remember the words that appear early in the list quite well. This is interpreted as reflecting memory of those words from long-term memory since those words have been rehearsed or practiced the most from the list and have had a chance to be stored in memory. The middle part of the list of information is recalled less well because these items have not been rehearsed as much as earlier items and they are seen as being in transition between short-term and long term memory stores. Finally, items from the end of the list are often recalled quite well since this information is still in short-term memory and therefore readily available since they were most recently studied (and especially if the person outputs these words first). This 'recency' effect is quite robust and reflects the activity of short-term memory (see graph below from a typical memory test) and be quite useful in identifying memory problems.



Finally, an important part of memory functions concerns the interaction of long-term and working memory. The process of storing new information in long-term memory allows a person to build a mental library of information. However, once information has been stored in long-term memory, it is available for use in working memory and allows a person to use preexisting associations from their mental library to make it easier to store new memories or learn new information. There are many names for this activity in memory research but the important aspect is that association of to-be-learned (or to-be-used) information with what is already in the mind of the user, allows for a more rapid and efficient use of the memory system. For example, if a person wishes to remember items that need to be purchased at the store, these items can be remembered better if they are grouped into categories (e.g., fruits, meats, bakery goods, dairy products) or perhaps linked to a favorite recipe for later recall than if these preexisting associations between grocery items are remembered in a 'random' order.

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Summary. Based on the brief and extremely simplified view of memory processes presented above, we can now turn to the question of the relevance of these memory processes to the use of the 311 dialing code for information about traffic conditions. First, this number is brief and readily fits into short-term or working memory (thereby reducing mental effort). Second, the sequence is short enough that people can readily dial it without losing this number and sequence (it is shorter than the human memory span of 5 to 9 digits), and third, it readily fits with information that is well learned by most persons (e.g., 911 code for emergencies) which should further enhance its memorability. Further, a longer string of digits such as the land-line number used at the present time even though it uses the same digit repeated seven times, may exceed the memory capacity of some persons, may interfere with attentional processes as this is dialed, and does not appear to readily fit with the 'mental set' or representation of telephone numbers that persons may dial on a routine basis. However, a discussion of the length of the dialing code and its potential impact on divided attention is perhaps best discussed as a human factors issue.