



Appendix D: The Northwest Butler Transportation Plan Purpose and Need Statement

THE NORTHWEST BUTLER TRANSPORTATION PLAN PURPOSE AND NEED STATEMENT

I. BACKGROUND

The Northwest Butler Transportation Study (NBTS) provided an in-depth assessment of the transportation needs and possible solutions to transportation-related problems in a 125 square mile area centered on two major roads, US 27 and SR 73, in northwest Butler County. The purpose of this study was to determine a recommended long range strategic plan of implementable improvements for future transportation in the NBTS area to forward to OKI for incorporation into the OKI Regional Transportation Plan. The study followed a logical step by step planning approach to identify project goals and transportation problems and needs, explore and evaluate alternative improvement options, and to determine a long range strategic plan for the area. The planning process was designed to provide transportation decision makers with the facts and analysis needed to make intelligent, informed choices for the best use of transportation resources.

The purpose of the study was two-fold: 1) to identify the transportation problems that affect the safe and efficient movement of people and goods in northwest Butler County, and 2) to determine an effective, comprehensive and implementable transportation solution that is consistent with the land use planning goals for the area.

II. STUDY GOALS

Following the identification of project stakeholders and the establishment of a project Advisory Committee, the first task in the NBTS was to identify and develop the goals for the project study. Once the transportation problems and needs in the NBTS area were initially identified, the overall goals for the study were developed and refined during early Advisory Committee meetings and confirmed by public review through open public involvement meetings.

In all, the Advisory Committee developed four overall goals for the project study. These goals were established to stand as the core foundation for the study, forming the basis for the evaluation of every alternative solution considered for incorporation into the final Strategic Plan. As the NBTS has progressed through the ODOT's Five-Step Transportation Planning Process, the Advisory Committee continually returned to these goals to evaluate and refine its focus on the transportation problems and needs for the NBTS area. Consequently, the study goals have been continuously verified and more comprehensively defined as the study progressed. A summary of the four study goals identified by the NBTS Advisory Committee is presented below:

- **Goal 1 - Improve Travel Efficiency**

A major goal for the NBTS is to improve the movement of people and goods in and through the NBTS area. More specifically, the transportation improvements or plan

needs:

- to provide an acceptable transportation level of service through the year 2030,
- to better manage truck movement in the study area and through Oxford and the Miami University campus, and
- to promote county-wide transit service.

The following considerations relate to the goal of improving travel efficiency:

- Focus on US 27 and SR 73 as primary routes for improvement in NBTS area;
- Address identified areas of congestion (intersections, sections of major roads);
- Provide for MU / Oxford regional needs and opportunities for local improvements to be made in conjunction with area-wide plan;
- Improve east - west SR 129 connection in Millville area (for better east - west connectivity);
- Provide for better access management for existing development (and consider access management role in guiding future development);
- Provide better access and level of service for special event traffic;
- Provide separation of through and local travel needs; and
- Consider benefits of other modes of travel including transit, bicycle and pedestrian as part of solution.

• **Goal 2 - Improve Travel Safety**

Another major goal of the NBTS is to improve vehicular travel and pedestrian safety throughout the study area. Plans to improve travel safety needs to be based on the identification and correction of existing roadway deficiencies that contribute to unsafe travel in the study area, as well as to address vehicular/pedestrian conflict issues (including issues with through truck traffic) on the campus of Miami University and in the City of Oxford's uptown area.

The following considerations relate to the goal of improving travel safety:

- Address identified safety problem areas (intersections and road sections with high accident rate history);
- Upgrade roads to safe standards in terms of lane and shoulder widths;
- Reduce vehicular / pedestrian conflict points or areas;
- Consider access management needs (existing and future land use); and
- Provide separation of through and local travel needs to improve safe property access.

• **Goal 3 - Improve Regional Accessibility**

A third goal for the NBTS is the improvement of regional accessibility. Alternative solutions will be developed for this study in an effort to improve access and connectivity between the NBTS area and regional neighbors. Access to points of regional interest, including economic centers, public services, and parks/recreational areas, through the improvement of both north-south and east-west travel routes, is a key goal of the NBTS.

The following considerations relate to the goal of improving regional accessibility:

- Improve north - south through travel facilities;
- Provide for improved regional access to economic centers and interest points (Oxford, Miami University, McCullough-Hyde Hospital, Hueston Woods State Park, others); and
- Address east - west connectivity needs.

• **Goal 4 - Preservation of Character / Compatibility with Land Use Plans**

Finally, the Advisory Committee determined that alternative solutions developed for this study should preserve the existing character of the area and ensure that the improvements are compatible with and support the adopted land use plans of townships and incorporated communities.

The following considerations relate to the goal of preserving character and ensuring the transportation plan's compatibility with land use plans:

- Provide means for growth management and support for adopted township and local long range planning goals;
- Avoid / minimize impact on cultural historic resources, parks, natural resources, farmland, and existing development;
- Preserve small town character of Oxford and rural landscape and character of NBTS area; and
- Support MU and Oxford needs as regional center for area jobs, as well as cultural, educational and entertainment opportunities.

III. PROBLEM IDENTIFICATION

The transportation needs of Northwest Butler County predominantly relate to travel efficiency and safety. As the project goals reflect, the improvement of transportation is also important to provide for regional accessibility and support of recently adopted land use plans.

These goals and the identification of the area's transportation problems and needs were developed by the people who live, work, and travel the study area on a daily basis. The NBTS was conducted under the direction and full participation of a group of volunteer stakeholders, through an organized Advisory Committee, and every step and decision was presented to the general public for review and comment through an extensive public involvement effort.

The transportation problems in the NBTS area consist primarily of deficiencies with the current roadway network combined with increasing traffic volumes that has contributed to high accident rates. Regional accessibility limitations, growing areas of congestion and decreasing level of service, while not considered at critically unacceptable levels currently, are anticipated to become more problematic over time based on the evidence of increasing pressure for converting agricultural lands to residential development and projected population growth in this area.

Additional discussion of the identified transportation problems in the NBTS area is presented

below.

A. Existing Transportation Network Deficiencies

The existing transportation network in the NBTS area is predominantly automobile based, and consists of a number of rural, two-lane federal and state highways, as well as a grid of local county, township, and city / village roads. The only existing high-capacity, multi-lane highway facility in the NBTS area is the southernmost four lane, divided highway section of US 27 between I-275 and SR 128. Some short portions of the federal and state highway network have been recently improved to acceptable standards of lane and shoulder width. However, for the most part, existing roadways in the NBTS area are already unable to safely and efficiently serve the present travel demand and patterns in the area, and will be insufficient to handle the future travel demands of the population increases projected for northwest Butler County. The primary deficiencies in the existing transportation network include:

Narrow Lane and Shoulder Widths and Roadside Hazards

A substantial amount of the primary state and federal highway system in the NBTS area has safety deficiencies in the form of narrow travel lanes (less than 12 feet wide), narrow shoulders (less than 6 feet wide), and substandard lateral clearance, such as deep roadside ditches and other adjacent roadside hazards, such as fences, utility lines/poles, trees, mailboxes, culvert headwalls and other drainage-related structures. The following tables note the mileage of roadway that needs to be upgraded for shoulder and lane widths on US 27, SR 73, and SR 177.

| Table 1: Substandard Shoulder Widths* | Milepoints | Existing Width | Total Miles |
|--|-----------------------------|-----------------------|--------------------|
| US 27 (South of Oxford) (Locations with shoulders < 10') | 0.6 to 2.5 (both sides) | 8' (SB); 3' (NB) | 1.9 |
| | 2.5 - 2.7 (both sides) | 5' | 0.2 |
| | 2.7 - 3.4 (both sides) | 0' | 0.7 |
| | 3.4 - 4.0 (northbound only) | 1' | 0.6 |
| | 4.0 - 6.6 (Millville) | 2' - 8' | 2.6 |
| | 6.9 - 7.4 (Millville) | 2' | 0.5 |
| | 10.8-14.0 (both sides) | 3' | 3.2 |
| SR 73 (Oxford to US 127) (Locations with shoulders < 6') | 0.3-0.4 (westbound only) | 3' | 0.1 |
| | 0.4 - 1.6 (both sides) | 3' | 1.2 |
| | 1.6 - 1.9 (both sides) | 3' (WB); 4' (EB) | 0.3 |
| | 1.9 - 3.9 (both sides) | 1' | 2.0 |
| | 3.9 - 6.8 (both sides) | 3' | 2.9 |
| SR 177 (SR 73 to SR 130) (Locations with shoulders < 6') | 0.0 - 6.7 (both sides) | 2' | 6.7 |

* = shoulder width standards for US 27 are 10'; whereas other routes in area require 6' shoulders.

| Table 2: Lane Widths (Locations with lanes < 12') | Milepoints | Existing Width | Total Miles |
|---|------------------------|-----------------------|--------------------|
| US 27 | 4.0-5.2 (Millville) | 22' (2 lanes) | 1.2 |
| | 5.7-7.4 (Millville) | 20' (2 lanes) | 1.7 |
| | 10.8-14.0 (both lanes) | 19' (2 lanes) | 3.2 |
| SR 73 (Oxford to US 127) | 0.4-6.8 (both lanes) | 20' (2 lanes) | 6.4 |
| SR 177 (SR 73 to SR 130) | 0-6.7 (both lanes) | 22' (2 lanes) | 6.7 |

Roadway Curvature, No Passing Zones and Speed Limits

The rural highway system in the NBTS area is comprised of narrow, two lane facilities with much of the system posted for speed limits of 55 mile-per-hour. The NBTS area highway network also contains numerous segments marked as No Passing zones, as well as segments with substandard horizontal and vertical alignment. With increasing traffic volumes, including slower moving truck traffic, roadway alignment deficiencies and the lack of adequate passing zones, hazardous driving conditions are the result.

High Numbers of Access Points

As discussed above, the NBTS area highway network is comprised of narrow, two lane facilities in a generally rural land use setting that is gradually changing to accommodate increasing residential demands. Though rural residential and commercial development has steadily increased along the higher volume state and federal highways, there are few access restrictions in the NBTS area. As a result, there are currently over 400 access points along US 27 alone, primarily for private property driveway access. This level of uncontrolled access increases congestion, conflicting traffic movements and abrupt speed changes with a major impact on travel safety. Between 1995 and 1999, an average of over 100 access-related accidents occurred along US 27 in the NBTS area, accounting for almost 40 percent of all of the accidents on that facility in the study area (see Section III.C below). Routes such as US 27 currently designated with a functional classification as Rural Principal Arterial for most of its length in the NBTS area, actually serves a dual function as a rural collector or rural local road due to the high demand for property access up and down its length. At present, access management provisions are non-existent in this area with the exception of a short segment of US 27 between SR 130 and Stillwell Beckett Road, which includes a two way center turn lane.

Problematic Intersections

Analysis of traffic and accident data, as well as Advisory Committee and public input, has resulted in the identification of a number of problematic intersections in the NBTS area. Contributing factors to problems at these intersections include confusing intersection layout, poor lane / approach configuration, restricted sight visibility, intersection spacing problems, congestion (further aggravated at some intersections by heavy truck and

pedestrian traffic), and/or access conflicts. A total of 14 problem intersections have been identified in the NBTS area. Six of these intersections are located on US 27, south of the City of Oxford.

Lack of Alternative Transportation Options / Facilities

A key factor in the decreasing effectiveness of the local transportation network is the lack of alternative transportation options. At this time, there are limited public transit operations in the study area. Miami University operates a small bus transit operation (Miami Metro) serving the campus and the City of Oxford and providing transit connections between Oxford and Miami University satellite campuses in Hamilton and Middletown. In the past, Butler County Regional Transit Authority provided bus transit services in the area, including Oxford, and a limited on-demand service. However due to funding cuts and failure to pass a new tax levee in 2002, these services are not currently provided (note: in late 2003, Cincinnati Metro began discussion with the BCRTA for possible future limited service in Butler County). Furthermore, no bike or pedestrian facilities (other than sidewalks in the urban areas, such as Oxford and Millville) are currently located in the NBTS area. This forces bicycle and pedestrian traffic on to the local road and highway network, where deficient travel safety conditions already exist. The result is increased vehicle / bike / pedestrian conflict (especially prevalent in the City of Oxford / Miami University area), increased congestion (due in large part to increases in single occupancy vehicle traffic), decreased level-of-service, and overall decreased travel safety.

B. Congestion and Level of Service

Traffic Volumes and Congestion

In addition to deficiencies of the existing transportation network, the need for improvements in the NBTS area is further demonstrated by increasing travel volumes (and congestion) in the study area. On average, traffic volumes on US 27 from the Hamilton County line north to Oxford increased by nearly 20 percent from 1996 to 2000. According to preliminary projections from the OKI Regional Travel Demand Model, by 2030, traffic on US 27 is expected to further increase by nearly 65 percent from 2000 levels, on average. Similarly, increases are expected on other major routes through the NBTS area. Traffic volumes on US 127 are expected to increase by nearly 100 percent by 2030, while traffic volumes on SR 73 and SR 130 are expected to increase over 100 percent. By 2030, traffic volumes on SR 128 are expected to increase over 40 percent and traffic volumes on SR 732 are expected to increase over 150 percent.

These projected traffic volumes indicate that traffic congestion currently being experienced on the existing local road network will substantially increase if the transportation problems in the area are not addressed.

Level of Service

Level of Service is a quantitative and qualitative measure of traffic operations and conditions that takes into account the effects of several factors including: traffic, truck volumes (as a percentage of total), speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, convenience and operating costs. Although many of these factors are only indirectly considered, empirical data has been collected nationwide in independent studies to correlate level of service with each of these factors.

Level of Service is rated from A to F, with A being the highest level, and C being the generally accepted standard. For rural highways, level of service is defined in terms of density of traffic. Level A represents completely free flow conditions, where the operation of vehicles is unaffected by the presence of other vehicles and only constrained by geometric features of the facility and driver preferences. Level C represents a range in which the influence of traffic density on operations becomes marked and the ability to maneuver within the traffic stream and to select an operating speed is clearly affected by the presence of other vehicles. Average travel speeds are reduced and minor disruptions may be expected to cause some local deterioration in service. Level E represents operations at or near capacity, while Level F represents forced or breakdown flow, with complete traffic stoppages.

Based on 2000 traffic data, several of the major state and federal highway routes in the NBTS area currently have a substandard level of service (Level of Service D or E). These routes include substantial portions of US 27, SR 73, SR 130, SR 128, SR 177 and US 127. Considering the projected increases in traffic volumes on the NBTS highway network by 2030, as discussed above, the substandard level of service currently being experienced on the portions of the existing local road network will continue to degrade if the transportation problems in the area are not addressed.

C. Safety

Transportation safety is a major concern in the study area and under existing conditions and traffic volumes, a higher priority than the need to increase capacity or improve level of service. Most roads in the NBTS area are already experiencing traffic accidents at a rate (and severity) that exceeds statewide rates for similar roads. Deficiencies in the existing NBTS area transportation network (discussed Section III. A. above), along with increasing traffic volumes and decreasing levels of service (discussed in Section III.B above), will result in increasing hazardous travel conditions for motorists, as well as bicyclists and pedestrians.

To identify and evaluate recent accident history for NBTS roads, and to determine what effect the current congestion, level of service and physical deficiencies of the NBTS roadway network have recently had on travel safety in the NBTS area, traffic accident data for the five year period from 1995 -1999 was obtained from the Ohio Department of Public Safety. This database of information provides details on every reported accident in Butler County and includes details such as time, location, contributing factors and

severity of accidents. Traffic accident data was analyzed for all major roadways within the project study area and comparisons were made with statewide and countywide accident data. Statewide averages were obtained from 1999 Ohio Crash Facts, produced by the Ohio Department of Public Safety. This data was used in combination with a field inventory of the physical roadway conditions of state and US routes within the NBTS area to determine which factors are chiefly contributing to the higher number and severity of accidents.

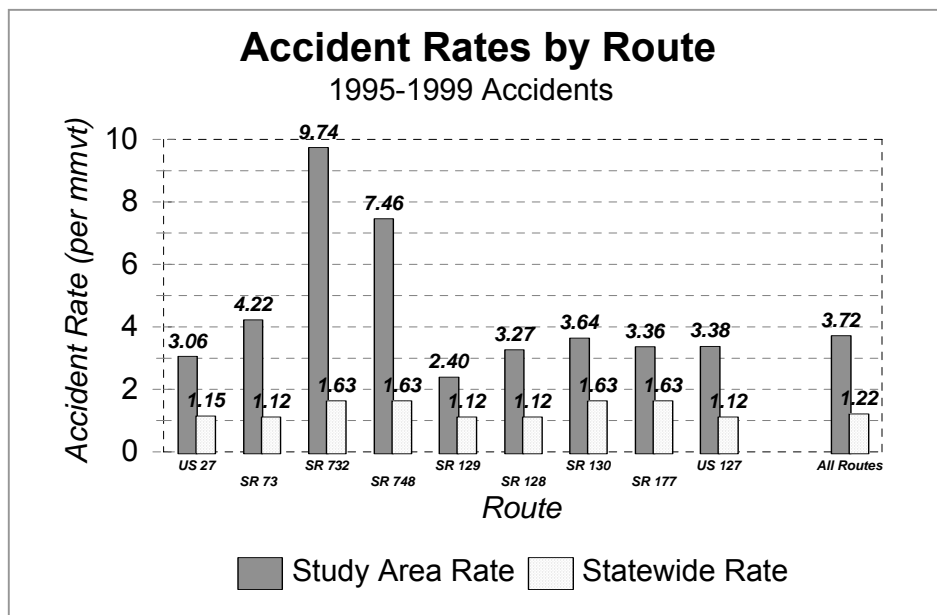
Summary of Accident Data in the NBTS Area

Accident Type and Severity

A total of 7,027 accidents occurred within the project study area during the five year period from 1995 to 1999. This total represents approximately 14 percent of all the reported accidents in Butler County and approximately 2 percent of all the reported accidents in the State of Ohio. Of the total accidents within the project study area, 68% were property damage only, 31% were personal injury accidents, and 0.5% involved a fatality.

Accidents on State and U.S. Routes

Approximately 48 percent of all accidents within the NBTS area occurred on State and/or U.S. routes. For comparison of the area's accident experience, annual accident rates in accidents per million vehicle miles traveled are derived based on roadway characteristics, functional classification, daily traffic volumes and annual average of traffic accidents. In this way, an area's roads can be fairly compared to other similar roads across the state. In the NBTS area, accident rates on all State and U.S. routes are above the Statewide average.



Accidents at Intersections

A total of 1,896 accidents (or 27 percent) in the NBTS area were at intersections or were intersection-related, and 12 intersections had at least 20 accidents from 1995 to 1999. The intersection of US 27 and SR 129 in Millville had the most accidents (41). The most common type of accidents among all the intersections were rear-end and angle accidents.

Accidents with Fatalities

A total of 37 accidents in the NBTS area between 1995 and 1999 involved a fatality, which averages to almost 8 per year.

Accidents Involving Trucks

A total of 1,134 accidents (over 16% of the five year total) in the NBTS area between 1995 and 1999 involved trucks. Approximately 68 percent of these accidents involved a truck driver at fault.

Pedestrian Accidents

Although accounting for less than one percent of all accidents within the project study, there were 65 accidents involving pedestrians between 1995 and 1999. Pedestrian safety is an important concern in the NBTS area primarily due to the high pedestrian volumes in the City of Oxford and on the campus of Miami University.

Comparison of Five-Year Data with Most Current Two-Year (2000-2001) Data

A review of the 2000 and 2001 accident data for US 27 and SR 73 (when it was released by the Ohio Department of Public Safety) revealed that the trends evident in the five years prior are continuing. When calculating the overall accident rates for US 27 and SR 73 over the seven year period (including the most recent 2000 and 2001 data), using year 2000 ADT numbers, accident rates have decreased slightly. However, both routes are still experiencing accident rates significantly higher than the statewide average.

D. Local and Regional Accessibility

The existing roadway network in the NBTS area does not adequately provide for the local and regional connectivity and accessibility demands of the area. Overburdened two lane facilities, as discussed above, connect areas of regional importance in terms of employment, education, health service, tourism, and entertainment in the Northwest Butler County area such as the City of Oxford, Miami University, McCullough-Hyde Memorial Hospital, and Hueston Woods State Park, with surrounding neighbors of the Cities of Hamilton and Fairfield, the remainder of Butler County, and the state of Indiana,

as well as southern Ohio, Hamilton County and the City of Cincinnati. Access to the interstate system, I-70 to the north, I-71 and I-75 to the east, and I-74 and I-275 to the south all require traversing two lane roadways.

The lack of connectivity is a critical concern, not only for its adverse effect on local commerce and emergency response services, but its impact on tourism and entertainment / event patronage (such as to Miami University and Hueston Woods State Park). Inadequate local and regional accessibility is also detrimental to the continued economic vitality of the area, by its effect on the movement of goods and services to and from local and regional markets.

IV. STATE AND REGIONAL TRANSPORTATION PLANS

Several projects related to the NBTS are currently in ODOT's statewide and OKI's regional transportation plans. Two proposed transportation projects in the NBTS area are currently listed in the Draft FY 2004-2007 Statewide Transportation Improvement Program (STIP) as part of OKI's Draft FY 2004-2007 Transportation Improvement Program, including: 1) the improvement of approximately 2 miles of US 27 north of the City of Oxford (widen to three lanes, sidewalks and signal improvement), and 2) the construction of approximately 0.8 mile of bikeway from Brookville Road to Fairfield Road on the west side of the City of Oxford. In addition, the OKI Regional Transportation Plan also includes one other project, the construction of a park-and-ride facility along US 27 near the City of Oxford.

Several recent local and regional transportation studies and land use plans for the area were reviewed in this study to help in formulating the understanding of the area's problems and needs. The following studies were reviewed:

- *Butler County Regional Transit Authority Strategic Plan (1999-2001), 1998;*
- *Butler County Township Land Use Plans, 1998;*
- *Butler County, Ohio Thoroughfare Plan, 1998;*
- *City of Oxford Comprehensive Plan, 1998;*
- *City of Oxford Truck Origin-Destination Study, March 1999;*
- *Oxford Township Community Survey, 2000;* and
- *Trenton Area Access Study, 2000.*

Common to each of these studies was the need to address existing area transportation problems and the need to plan for the future improvement of transportation in this area. Each of these studies provided important insight to the problem identification and goal setting for the Northwest Butler Transportation Study. However, early in the study process, the Advisory Committee recognized the particular importance of three of these studies and their relationship the transportation planning process. The three key studies were: the Township Land Use Plans, the Oxford Comprehensive Plan and the Oxford Truck Origin-Destination Study.

The land use planning efforts of the eight townships, Butler County and the City of Oxford provided a current, up-to-date vision of what local planners and citizens envisioned for Northwest Butler County. The Advisory Committee reviewed these future land use plans and used these to evaluate how alternative transportation improvements could not only support the land use goals, but also be compatible with desired land use development patterns. As discussed in the next section, the Committee established one of the NBTS Plan's goal to be the preservation of the rural character of the Northwest Butler County area and the small town ambience of the Oxford, Millville, Darrrtown, and the other communities in the area, while at the same time addressing pressing transportation needs and desires.

The Oxford Truck Origin - Destination Study was also an area of focus in that it provided some key quantitative measurement of the perceived concerns over increased heavy truck traffic in the area. This study, conducted in 1998, concluded that there is a significant volume of truck traffic serving the northwest Butler County area and the City of Oxford, but there was also a significant portion of that truck traffic that was just passing through. The study measured the truck volume in and through the City of Oxford and concluded that while three-fourths of the daily truck (and bus) volumes related to business in Oxford, almost half of the heavy truck volume during the peak hours of the day was only passing through. In other words, the truck volumes perceived to be the most problematic in terms of motorist and pedestrian safety and congestion, were indeed caused by through trucks. The study further concluded that removal of the heavy trucks during peak hours, by re-routing, would reduce truck volumes in Oxford by almost 60%. As the Northwest Butler Transportation Study progressed, the issue of trucks and particularly their effect on travel safety and on pedestrian conflicts in Oxford and through the Miami University campus was reviewed continually in the alternative improvement plan development and evaluation process.

On September 10, 2003, the Advisory Committee reached a consensus to advance a recommended plan to the OKI Board. The findings of the Northwest Butler Transportation Study, including the Advisory Committee's recommendation of Alternative 5C, were presented to the Ohio Kentucky Indiana Regional Council of Governments (OKI) Board of Trustees on October 9, 2003. The Board approved a resolution adopting the study findings and recommendation at that meeting. It is anticipated that the recommended plan will become part the OKI Regional Transportation Plan when the plan is next updated in 2004.



Northwest Butler Transportation Study

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Butler County Engineer's Office,
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