

# **IX. APPENDICES**

IX. Appendices

---

## **MD 210 MULTI-MODAL STUDY**

## Fish Fauna of Piscataway and Henson Creek Watersheds

### Piscataway Creek Watershed

<u>Family</u>	<u>Common Name</u>	<u>Scientific Name</u>
<b>Petromyzonidae</b>	American brook lamprey	<i>Lampetra appendix</i> <sup>1, 2</sup>
	least brook lamprey	<i>Lampetra aepyptera</i> <sup>1, 2</sup>
<b>Anguillidae</b>	American eel	<i>Anguilla rostrata</i> <sup>1, 2</sup>
<b>Esocidae</b>	redfin pickerel	<i>Esox americanus</i> <sup>1</sup>
	chain pickerel	<i>Esox niger</i> <sup>1, 2</sup>
<b>Umbridae</b>	eastern mudminnow	<i>Umbra pygmaea</i> <sup>1, 2</sup>
<b>Cyprinidae</b>	blacknose dace	<i>Rhinichthys atratulus</i> <sup>1, 2</sup>
	comely shiner	<i>Notropis amoenas</i> <sup>1, 2</sup>
	common shiner	<i>Luxillus cornutus</i> <sup>1, 2</sup>
	cutlips minnow	<i>Exoglossum maxillingua</i> <sup>1, 2</sup>
	creek chub	<i>Semotilus atromaculatus</i> <sup>1, 2</sup>
	eastern silvery minnow	<i>Hybognathus regius</i> <sup>1, 2</sup>
	fallfish	<i>Semotilus corporalis</i> <sup>1, 2</sup>
	golden shiner	<i>Notemigonus crysoleucas</i> <sup>1, 2</sup>
	longnose dace	<i>Rhinichthys caprodes</i> <sup>1, 2</sup>
	rosyside dace	<i>Clinostomus funduloides</i> <sup>1, 2</sup>
	satinfin shiner	<i>Cyprinella analostana</i> <sup>1, 2</sup>
	silvery minnow	<i>Hybognathus nuchalis</i> <sup>1, 2</sup>
	spottail shiner	<i>Notropis hudsonius</i> <sup>1, 2</sup>
	swallowtail shiner	<i>Notropis procne</i> <sup>1, 2</sup>

<b>Catostomidae</b>	creek chubsucker white sucker	<i>Erimyzon oblongus</i> <sup>1, 2</sup> <i>Catostomus commersoni</i> <sup>1, 2</sup>
<b>Ictaluridae</b>	brown bullhead channel catfish yellow bullhead marginated madtom	<i>Ameiurus nebulosus</i> <sup>1, 2</sup> <i>Ictalurus punctatus</i> <sup>1</sup> <i>Ameiurus natalis</i> <sup>2</sup> <i>Noturus insignis</i> <sup>1, 2</sup>
<b>Cyprinodontidae</b>	banded killifish mummichog rainwater killifish	<i>Fundulus diaphanous</i> <sup>1, 2</sup> <i>Fundulus heteroclitus</i> <sup>1</sup> <i>Lucania parva</i> <sup>1</sup>
<b>Poeciliidae</b>	mosquitofish	<i>Gambusia holbrooki</i> <sup>1, 2</sup>
<b>Centrarchidae</b>	bluegill green sunfish pumpkinseed redbreasted sunfish largemouth bass smallmouth bass	<i>Lepomis macrochirus</i> <sup>1, 2</sup> <i>Lepomis cyanellus</i> <sup>2</sup> <i>Lepomis gibbosus</i> <sup>1, 2</sup> <i>Lepomis auritus</i> <sup>2</sup> <i>Micropterus salmoides</i> <sup>1, 2</sup> <i>Micropterus dolomieu</i> <sup>2</sup>
<b>Percidae</b>	tesselated darter yellow perch	<i>Etheostoma olmstedii</i> <sup>1, 2</sup> <i>Perca flavescens</i> <sup>1</sup>
<b>Henson Creek Watershed</b>		
<b>Anguillidae</b>	American eel	<i>Anguilla rostrata</i>

**Umbridae**

eastern mudminnow	<i>Umbra pygmaea</i>
-------------------	----------------------

**Cyprinidae**

blacknose dace	<i>Rhinichthys atratulus</i>
carp	<i>Cyprinus carpio</i>
common shiner	<i>Luxillus cornutus</i>
creek chub	<i>Semotilus atromaculatus</i>
golden shiner	<i>Notemigonus crysoleucas</i>

longnose dace	<i>Rhinichthys caprodes</i>
rosyside dace	<i>Clinostomus funduloides</i>
satinfin shiner	<i>Cyprinella analostana</i>
spottail shiner	<i>Notropis hudsonius</i>
swallowtail shiner	<i>Notropis procne</i>

**Catostomidae**

creek chubsucker	<i>Erimyzon oblongus</i>
white sucker	<i>Catostomus commersoni</i>

**Ictaluridae**

yellow bullhead	<i>Ameiurus natalis</i>
-----------------	-------------------------

**Cyprinodontidae**

mummichog	<i>Fundulus heteroclitus</i>
-----------	------------------------------

**Centrarchidae**

bluegill	<i>Lepomis macrochirus</i>
green sunfish	<i>Lepomis cyanellus</i>
pumpkinseed	<i>Lepomis gibbosus</i>
redbreasted sunfish	<i>Lepomis auitus</i>

**Percidae**

tesselated darter	<i>Etheostoma olmstedii</i>
-------------------	-----------------------------

<sup>1</sup> Denotes species identified by the Stormwater Management Technical Group

<sup>2</sup> Denotes species identified as part of the Maryland Biological Stream Survey

## Terrestrial Fauna of Piscataway and Henson Creek Watersheds

### AMPHIBIANS

#### Order Caudata – Salamanders and Newts

Family	Common Name	Scientific Name
<b>Ambystomatidae</b>	marbled salamander	<i>Ambystoma opacum</i>
	spotted salamander	<i>Ambystoma maculatum</i>
<b>Salamandridae</b>	red-spotted newt	<i>Notophthalmus viridescens</i>
<b>Plethodontidae</b>	eastern mud salamander	<i>Pseudotriton montanus</i>
	four-toed salamander	<i>Hemidactylium scutatum</i>
	longtail salamander	<i>Eurycea longicauda</i>
	northern dusky salamander	<i>Desmognathus fuscus</i>
	northern red salamander	<i>Pseudotriton ruber</i>
	northern slimy salamander *	<i>Plethodon glutinosus</i>
	northern two-lined salamander	<i>Eurycea bislineata</i>
redback salamander	<i>Plethodon cinereus</i>	

#### Order Anura – Toads and Frogs

<b>Bufonidae</b>	American toad *	<i>Bufo americanus</i>
	Fowler's toad	<i>Bufo woodhousii fowleri</i>
	Spadefoot toad	<i>Schaphiopus holbrooki</i>

## **Hylidae**

eastern gray treefrog	<i>Hyla versicolor</i>
green treefrog	<i>Hyla cinerea</i>
northern cricket frog	<i>Acris creptans</i>
northern spring peeper *	<i>Pseudoacris crucifer</i>
southern gray treefrog	<i>Hyla chrysocelis</i>
upland chorus frog	<i>Pseudoacris triseriataferiarum</i>

## **Ranidae**

bullfrog	<i>Rana catesbeiana</i>
green frog *	<i>Rana clamitans</i>
pickerel frog *	<i>Rana palustris</i>
southern leopard frog *	<i>Rana utricularia</i>
wood frog *	<i>Rana sylvatica</i>

## **REPTILES**

### **Order Squamata – Lizards and Snakes**

#### **Iguanidae**

northern fence lizard	<i>Sceloporus undulatus</i>
-----------------------	-----------------------------

#### **Scincidae**

broad-headed skink	<i>Eumeces laticeps</i>
five-lined skink	<i>Eumeces fasciatus</i>
ground skink	<i>Scincella lateralis</i>
six-lined racerunner	<i>Cnemidophorus sexlineatus</i>

#### **Colubridae**

black rat snake *	<i>Elaphe obsoleta</i>
corn snake	<i>Elaphe guttata</i>

eastern earth snake	<i>Virginia valeriae</i>
eastern garter snake*	<i>Thamnophis sirtalis</i>
eastern hognose snake	<i>Heterodon platyrhinos</i>
eastern kingsnake	<i>Lampropeltis getula getula</i>
eastern milksnake	<i>Lampropeltis triangulum</i>
eastern ribbon snake	<i>Thamnophis sauritus</i>
eastern worm snake	<i>Carphophis amoenus</i>
mole kingsnake	<i>Lampropeltis alligaster</i>
northern black racer	<i>Coluber constrictor</i>
northern brown snake	<i>Storeria dekayi</i>
northern redbelly snake	<i>Storeria occipitomaculata</i>
northern ringneck snake	<i>Diadophis punctatus</i>
northern scarlet snake	<i>Cemophora coccinea</i>
northern water snake *	<i>Nerodia sipedon</i>
queen snake	<i>Regina sepemvittata</i>
rough green snake	<i>Opheodrys aestivus</i>
<b>Viperidae</b>	
northern copperhead	<i>Agkistrodon (continued)ortrix mokasen</i>

## Order Testudines – Turtles

### Chelydridae

snapping turtle *	<i>Chelydra serpentina</i>
-------------------	----------------------------

### Kinosternidae

eastern mud turtle	<i>kinosternon subrubrum</i>
stinkpot	<i>Sternotherus odoratus</i>

### Emydidae

eastern box turtle*	<i>Terrapine carolina</i>
eastern painted turtle *	<i>Chysemys picta</i>
red-bellied turtle *	<i>Pseudemys rubiventris</i>
red-eared slider	<i>Trachemys scripta elegans</i>

spotted turtle

*Clemmys guttata*

wood turtle

*Clemmys insculpta*

## **BIRDS**

### **Order Podicipediformes – Grebes**

#### **Gaviidae**

Horned grebe

*Podiceps auritus*

### **Order Anseriformes – Geese And Ducks**

#### **Anatidae**

black duck \*

*Anas rubripes*

bufflehead

*Bucephala albeola*

Canada goose \*

*Branta canadensis*

lesser scaup

*Aythya affinis*

Mallard \*

*Anas platyrhynchos*

red-breasted merganser

*Mergus serrator*

wood duck \*

*Aix sponsa*

### **Order Falconiformes – Vultures and Hawks**

#### **Cathartidae**

black vulture \*

*Cathartes atratus*

turkey vulture \*

*Cathartes aura*

#### **Acciptridae**

Bald eagle

*Haliaeetus leucocephalus*

broad-winged hawk \*

*Buteo platypterus*

northern harrier

*Circus cyaneus*

red-shouldered hawk

*Buteo lineatus*

red-tailed hawk \* *Buteo jamaicensis*  
sharp-shinned hawk \* *Accipiter striatus*

### **Pandionidae**

osprey *Pandion haliaetus*

### **Falconidae**

American kestrel \* *Falco sparverius*

## **Order Galliformes – Upland Gamebirds**

### **Phasianidae**

northern bobwhite *Colinus virginianus*  
ring-necked pheasant *Phasianus colchicus*

## **Order Ciconiiformes – Herons**

### **Ardeidae**

black-crowned night heron *Nycticorax nycticorax*  
great blue heron \* *Ardea herodias*  
great egret *Casmerodius albus*  
green heron \* *Butorides striatus*  
yellow-crowned night heron *Nycticorax violace*

## **Order Gruiformes – Cranes**

### **Rallidae**

coot *Fulica americana*  
king rail *Rallus elegans*  
sora *Porzana carolina*  
Virginia rail *Rallus limicola*

## **Order Charadriiformes – Plovers**

## **Charadriidae**

killdeer \* *Charadrius vociferus*

## **Scolopacidae**

American woodcock *Scolopax minor*  
common snipe *Gallinago gallinago*  
greater yellowlegs *Tringa melanoleucus*  
solitary sandpiper *Tringa solitaria*  
spotted sandpiper *Actitis macularia*

## **Laridae**

Herring gull *Larus argentatus*  
Ring-billed gull *Larus delawarensis*

## **Order Columbiformes – Doves and Pigeons**

### **Columbidae**

mourning dove \* *Zenaida macroura*  
rock dove *Columba livia*

## **Order Cuculiformes – Cuckoos**

### **Cuculidae**

black-billed cuckoo *Coccyzus erythrophthalmus*  
yellow-billed cuckoo *Coccyzus americanus*

## **Order Strigiformes – Owls**

### **Strigidae**

barred owl *Strix varia*  
great horned owl *Bubo virginianus*

screech owl

*Otus asio*

**Order Caprimulgiformes – Goatsuckers**

**Caprimulgidae**

chuck-will's-widow

*Caprimulgus carolinensis*

whip-poor-will

*Caprimulgus vociferus*

common nighthawk

*Chordeiles minor*

**Order Apodiformes – Swifts and Hummingbirds**

**Apodiformidae**

chimney swift

*Chaetura pelagica*

**Trochilidae**

ruby-throated hummingbird \*

*Archilochus colubris*

**Order Caraciiformes – Kingfishers**

**Alcedinidae**

belted kingfisher \*

*Ceryl alcyon*

**Order Piciformes – Woodpeckers**

**Picidae**

northern flicker \*

*Colaptes auratus*

pileated woodpecker\*

*Dryocopus pileatus*

red-bellied woodpecker \*

*Melanerpes carolinus*

red-headed woodpecker

*Melanerpes erythrocephalus*

yellow-bellied sapsucker

*Sphyrapicus varius*

hairy woodpecker \*

*Picoides villosus*

downy woodpecker \*

*Picoides pubescens*

## Order Passiformes – Perching Birds

### Tyrannidae

Acadian flycatcher

*Empidonax virescens*

eastern kingbird

*Tyrannus tyrannus*

eastern phoebe \*

*Sayornis phoebe*

eastern wood pewee

(continued)*opus virens*

great-crested flycatcher

*Myiarchus crinitus*

willow flycatcher

*Empidonax trailii*

### Hirundinidae

bank swallow

*Riparia riparia*

barn swallow

*Hirundo rustica*

cliff swallow

*Petrochelidon pyrrhonta*

purple martin

*Progne subis*

rough-winged swallow

*Stelgidopteryx ruficollis*

tree swallow

*Tachycineta bicolor*

### Corvidae

American crow \*

*Corvus brachyrhynchos*

blue jay \*

*Cyanocitta cristata*

fish crow

*Corvus ossifragus*

### Paridae

black-capped chickadee

*Parus atricapillus*

Carolina chickadee \*

*Parus carolinensis*

tufted titmouse \*

*Parus bicolor*

**Sittidae**

white-breasted nuthatch *Sitta carolinensis*

**Certhiidae**

brown creeper *Certhia americana*

**Troglodytidae**

Carolina wren \* *Thryothorus ludovicianus*

house wren *Troglodytes aedon*

marsh wren *Cistothorus palustris*

winter wren *Troglodytes troglodytes*

**Mimidae**

brown thrasher *Toxostoma rufum*

gray catbird \* *Dumetella carolinensis*

northern mockingbird \* *Mimus polyglottos*

**Muscicapidae**

American robin \* *Turdus migratorius*

blue-gray gnatcatcher \* *Polioptila caerulea*

eastern bluebird \* *Sialia sialis*

golden-crowned kinglet *Regulus satrapa*

gray-cheeked thrush *Catharus minimus*

hermit thrush *Catharus guttata*

ruby-crowned kinglet *Regulus calendula*

Swainson's thrush *Catharus ustulatus*

veery *Catharus fuscescens*

wood thrush \* *Hylocichla mustelina*

**Bombycillidae**

cedar waxwing *Bombycilla cedrorum*

## **Sturnidae**

European starling \* *Sturnus vulgaris*

## **Virionidae**

red-eyed vireo *Vireo olivaceus*  
solitary vireo *Vireo solitarius*  
warbling vireo *Vireo gilvus*  
white-eyed vireo *Vireo griseus*  
yellow-throated vireo *Vireo flavifrons*

## **Parulidae**

American redstart *Setophaga ruticilla*  
bay-breasted warbler *Dendroica castanea*  
black-and-white warbler *Mniotilta varia*  
blackburnian warbler *Dendroica fusca*  
black-throated blue warbler *Dendroica caerulescens*  
black-throated green warbler *Dendroica virens*  
blue-winged warbler *Vermivora pinus*  
Canada warbler *Wilsonia canadensis*  
chestnut-sided warbler *Dendroica pensylvanica*  
common yellow-throat \* *Geothlypis trichas*  
golden-winged warbler *Vermivora chrysoptera*  
hooded warbler \* *Wilsonia trichas*  
Kentucky warbler *Oporornis formosus*  
Louisiana waterthrush *Seiurus motacilla*  
magnolia warbler *Dendroica magnolia*  
mourning warbler *Oporornis philadelphia*  
Nashville warbler *Vermivora ruficapilla*  
northern parula warbler *Parula americana*  
ovenbird *Seiurus aurocapillus*  
pine warbler *Dendroica pinus*

prairie warbler	<i>Dendroica discolor</i>
Tennessee warbler	<i>Vermivora peregrina</i>
worm-eating warbler	<i>Helmitheros vermivorus</i>
yellow warbler *	<i>Dendroica petechia</i>
yellow-breasted chat	<i>Icteria virens</i>
yellow-rumped warbler	<i>Dendroica coronata</i>

### **Icteridae**

northern oriole	<i>Icterus galbula</i>
orchard oriole	<i>Icterus spurius</i>
common grackle *	<i>Quiscalus quiscula</i>
brown-headed cowbird *	<i>Molothrus ater</i>
red-winged blackbird *	<i>Agelaius phoeniceus</i>
eastern meadowlark	<i>Sturnella magna</i>

### **Thraupidae**

scarlet tanager	<i>Piranga olivacea</i>
-----------------	-------------------------

### **Fringillidae**

northern cardinal *	<i>Cardinalis cardinalis</i>
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
blue grosbeak	<i>Guiraca caerulea</i>
indigo bunting *	<i>Passerina cyanea</i>
evening grosbeak	<i>Coccothraustes vespertinus</i>
purple finch	<i>Carpodacus purpureus</i>
house finch	<i>Carpodacus mexicanus</i>
American goldfinch *	<i>Carduelis tristis</i>
rufous-sided towhee *	<i>Pipilo erythrophthalmus</i>
northern junco	<i>Junco hyemalis</i>
Henslow's sparrow	<i>Ammodramus henslowii</i>
American tree sparrow	<i>Spizella arborea</i>

chipping sparrow *	<i>Spizella passerina</i>
field sparrow	<i>Spizella pusilla</i>
white-crowned sparrow	<i>Zonotrichia leucophrys</i>
white-throated sparrow *	<i>Zonotrichia albicollis</i>
song sparrow *	<i>Melospiza melodia</i>

### **Ploceidae**

house sparrow *	<i>Passer domesticus</i>
-----------------	--------------------------

### **Mammals**

#### **Order Marsupialia – Pouched Mammals**

### **Didelphidae**

Virginia opossum *	<i>Didelphis virginiana</i>
--------------------	-----------------------------

#### **Order Insectivora – Shrews and Moles**

### **Soricidae**

masked shrew	<i>Sorex cinereus</i>
southeastern shrew	<i>Sorex longirostris</i>
pygmy shrew	<i>Sorex hoyi</i>
short-tailed shrew*	<i>Sorex brevicauda</i>
least shrew	<i>Cryotis parva</i>

### **Talpidae**

eastern mole	<i>Scalopus aquaticus</i>
star-nosed mole	<i>Condylura cristata</i>

#### **Order Chiroptera – Bats**

### **Vespertilionidae**

little brown myotis	<i>Myotis lucifugus</i>
Keen's myotis	<i>Myotis keenii</i>
small-footed myotis	<i>Myotis leibii</i>
silver-haired bat	<i>Lasionycteris noctivagans</i>
eastern pipistrelle	<i>Pipistrellus subflavus</i>
big brown bat	<i>Eptesicus fuscus</i>
red bat	<i>Lasiurus borealis</i>
hoary bat	<i>Lasiurus cinereus</i>
evening bat	<i>Nycticeius humeralis</i>

### **Order Lagomorpha – Rabbits**

#### **Leporidae**

eastern cottontail *	<i>Sylvilagus floridanus</i>
----------------------	------------------------------

### **Order Rodentia – Rodents**

#### **Sciuridae**

eastern chipmunk *	<i>Tamias striatus</i>
woodchuck *	<i>Marmota monax</i>
gray squirrel *	<i>Sciurus carolinensis</i>
red squirrel	<i>Tamiasciurus hudsonicus</i>
southern flying squirrel	<i>Glaucomys volans</i>

#### **Castoridae**

beaver *	<i>Castor canadensis</i>
----------	--------------------------

#### **Cricetidae**

eastern harvest mouse	<i>Reithrodontomys humulis</i>
deer mouse	<i>Peromyscus maniculatus</i>
white-footed mouse	<i>Peromyscus leucopus</i>

meadow vole *	<i>Microtus pennsylvanicus</i>
woodland vole	<i>Microtus pinetorum</i>
muskrat *	<i>Ondatra zibethicus</i>
southern bog lemming	<i>Synaptomys cooperi</i>

### **Muridae**

Norway rat	<i>Rattus norvegicus</i>
house mouse	<i>Mus musculus</i>

### **Zapodidae**

meadow jumping mouse	<i>Zapus hudsonicus</i>
----------------------	-------------------------

## **Order Carnivora – Carnivores**

### **Canidae**

coyote	<i>Canis latrans</i>
red fox *	<i>Vulpes vulpes</i>
gray fox	<i>Urocyon cinereoargenteus</i>

### **Procyonidae**

raccoon *	<i>Procyon lotor</i>
-----------	----------------------

### **Mustelidae**

long-tailed weasel	<i>Mustela frenata</i>
mink	<i>Mustela vison</i>
striped skunk	<i>Mephitis mephitis</i>

### **Felidae**

bobcat	<i>Felis rufus</i>
--------	--------------------

## **Order Artiodactyla – Even-toed Ungulates**

**Cervidae**

white-tailed deer \*

*Odocoileus virginianus*

\* Denotes species observed while conducting field studies.

## List of Common to Scientific names for Plants listed

American beech	<i>Fagus grandifolia</i>
black cherry	<i>Prunus serotina</i>
black gum	<i>Nyssa sylvatica</i>
black haw	<i>Viburnum prunifolium</i>
black locust	<i>Robinia pseudo-acacia</i>
black oak	<i>Q. velutina</i>
black walnut	<i>Juglans nigra</i>
chestnut oak	<i>Quercus prinus</i>
common high bush blueberry	<i>Vaccinium. corymbosum</i>
deerberry	<i>Vaccinium stamineum</i>
eastern cedar	<i>Juniperus virginiana</i>
eastern chinquapin	<i>Castanea pumila</i>
ebony spleenwort	<i>Asplenium platyneuron</i>
enchanter's nightshade	<i>Circaea alpina</i>
flowering dogwood	<i>Cornus florida</i>
green ash	<i>Fraxinus pennsylvanica</i>
ground pine	<i>Diphasiastrum digitatum</i>
Indian pipe	<i>Monotropa uniflora</i>
ironwood	<i>Carpinus caroliniana</i>
jack-in-the-pulpit	<i>Arisaema triphyllum</i>
loblolly pine	<i>Pinus taeda</i>
low bush blueberry	<i>Vaccinium angustifolium</i>
maple-leaved viburnum	<i>Viburnum acerifolium</i>
mockernut hickory	<i>C. tomentosa</i>
mountain laurel	<i>Kalmia latifolia</i>
multiflora rose	<i>Rosa multiflora</i>
northern red oak	<i>Q. rubra</i>
partridge-berry	<i>Mitchella repens</i>
pignut hickory	<i>Carya glabra</i>

pin oak	<i>Q. palustris</i>
red maple	<i>Acer rubrum</i>
river birch	<i>Betula nigra</i>
shortleaf pine	<i>Pinus echinata</i>
southern arrow-wood	<i>Viburnum dentatum</i>
southern red oak	<i>Q. falcata</i>
southern running pine	<i>Diphasiastrum digitatum</i>
spicebush	<i>Lindera benzoin</i>
spotted wintergreen	<i>Chimaphila maculata</i>
sweetgum	<i>Liquidambar styraciflua</i>
sycamore	<i>Platanus occidentalis</i>
Virginia pine	<i>Pinus virginiana</i>
white avens	<i>Geum canadense</i>
white oak	<i>Quercus alba</i>
witch hazel	<i>Hamamelis virginiana</i>
yellow poplar	<i>Liriodendron tulipifera</i>

**SUMMARY OF THE RELOCATION ASSISTANCE PROGRAM OF THE  
STATE HIGHWAY ADMINISTRATION OF MARYLAND**

All State Highway Administration projects utilizing Federal funds must comply with the Uniform Relocation and Real Property Acquisition Policies Act of 1970 (42 USC 4601) as amended by Title IV of the Surface Transportation & Uniform Relocation Assistance Act of 1987 (P.L. 100-17) and Public Law 105-117. State funded projects must comply with Sections 12-112 and Subtitle 2, Sections 12-201 to 12-212 of the Real Property Article of the Annotated Code of Maryland.

The State Highway Administration's Office of Real Estate administers the Relocation Assistance Program for the Maryland Department of Transportation.

The aforementioned Federal and State laws require that the State Highway Administration provide relocation assistance payments and advisory services to eligible persons who are displaced by a public project. These are two categories of residential occupants: 180-day owner-occupants, and 90-day tenants and short-term owner occupants. Non-residential occupants may be businesses, farms or non-profit organizations.

A displaced person that has owned and occupied a subject dwelling for at least 180 days prior to the initiation of negotiations for the property may receive a replacement housing payment of up to \$22,500. The replacement housing payment is composed of three parts: a purchase price differential; an increased mortgage interest differential; and reimbursement for incidental settlement expenses.

The purchase price differential is the difference between the value paid by the State Highway Administration for the existing dwelling and the cost to the displaced owner of a comparable replacement dwelling, as determined by the State's replacement housing study.

The increased mortgage interest differential is a payment made to the owner at the time of settlement on the replacement dwelling to negotiate the effects of less favorable financing in the new situation. The payment is calculated by use of the "buy-down" mortgage method.

Reimbursable incidental expenses are necessary and reasonable incidental costs that are incurred by the displaced person in purchasing a replacement dwelling, excluding prepaid expenses such as real estate taxes and insurance. The maximum reimbursable amount for these incidental expenses upon the cost of the comparable selected in the replacement housing study.

A displaced person who has leased and occupied a subject dwelling for at least 90 days prior to the initiation of negotiations for the property may receive a replacement rental housing payment of up to \$5,250. The replacement rental housing payment is the difference between the monthly cost of housing for the subject dwelling, plus utilities, and the monthly cost of housing

for a comparable replacement rental unit, plus utilities, over a period of 42 months. Owner occupants of from 90-179 days prior to the initiation of negotiations for the subject dwelling are eligible for the same replacement rental housing payments as tenants.

As an alternative to renting, a displaced tenant occupant may elect to apply the rental replacement housing eligibility amount toward the down payment needed to purchase a replacement dwelling.

The comparable properties used in calculating any replacement housing payment eligibility must comply with all local standards for decent, safe and sanitary (DS&S) housing, and be within the financial means of the displaced person.

If affordable, comparable, DS&S replacement housing cannot be provided within the statutory maximums of \$22,500 for 180-day owner occupants or \$5,250 for 90-day tenants or short term owners, the maximums may be exceeded on a case by case basis. This may only be done after the completion and approval of a detailed study that documents the housing problem, explores the available replacement options and selects the most feasible and cost effective alternative for implementation.

In addition, eligible displaced residential occupants may be reimbursed for the expense of moving personal property up to a maximum distance of fifty (50) miles, using either an actual cost or fixed schedule method.

Actual cost moves are based upon the lower of at least two commercial moving estimates, and must be documented with receipted bills or invoices. Other incidental moving expenses, such as utility reconnection charges, may also be paid in the same manner.

As an alternative method, the fixed schedule move offers a lump sum, all-inclusive payment based upon the number of rooms to be moved. Other incidental costs are not separately reimbursable with this method.

Non-residential displaced persons such as businesses, farms or non-profit organizations may also receive reimbursement for the expense of relocating and re-establishing operations at a replacement site on either an actual cost or fixed payment basis.

Under the actual cost method, a non-residential displaced person may receive reimbursement for necessary and reasonable expenses for moving its personal property, the loss of tangible personal property that is not moved, the cost of searching for a replacement site, and a re-establishment allowance of up to \$10,000.

The actual reasonable moving expenses may be paid for a move by a commercial mover or for a self-move. Payments for the actual reasonable expenses are limited to a 50-mile radius unless the State determines a longer distance is necessary. The expenses claimed for actual cost moves must be supported by firm bids and receipted bills. An inventory of the items to be moved must be prepared in all cases. In self-moves, the State will negotiate an amount for payment, usually lower than the lowest acceptable bid. The allowable expenses of a self-move

may include amounts paid for equipment hired, the cost of using the business vehicles or equipment, wages paid to persons who participate in the move, the cost of actual supervision of the move, replacement insurance for the personal property moved, costs of licenses or permits required and other related expenses.

In addition to the actual moving expenses mentioned above, the displaced business is entitled to receive a payment for the actual direct losses of tangible personal property that the business is entitled to relocate but elects not to move. These payments may only be made after an effort by the owner to sell the personal property involved. The costs of the sale are also reimbursable moving expenses.

If the business elects not to move or to discontinue the use of an item, the payment shall consist of the lesser of: the fair market value of the item for continued use at the displacement site, less the proceeds from its sale; or the estimated cost of moving the item.

If an item of personal property which is used as part of a business or farm operation is not moved and is promptly replaced with a substitute item that performs a comparable function at the replacement site, payment shall be of the lesser of: the cost of the substitute item, including installation costs at the replacement site, minus any proceeds from the sale or trade-in of the replaced item; or the estimated cost of moving and reinstalling the replaced item.

In addition to the moving payment described above, a business may be eligible for a payment of up to \$10,000 for the actual reasonable and necessary expenses of reestablishing at the replacement site. Generally, reestablishment expenses include certain repairs and improvements to the replacement site, increased operating costs, exterior signing, advertising the replacement location and other fees paid to reestablish. Receipted bills and other evidence of these expenses are required for payment. The total maximum reestablishment payment eligibility is \$10,000.

In lieu of all moving payments described above, a business may elect to receive a fixed payment equal to the average annual net earnings of the business. This payment shall not be less than \$1,000 nor more than \$20,000. In order to be entitled to this payment, the State must determine that the business cannot be relocated without a substantial loss of its existing patronage; the business is not part of a commercial enterprise having more than three other establishments in the same or similar business that are not being acquired; and the business (continued)ributes materially to the income of a displaced owner during the two taxable years prior to the year of the displacement. A business operated at the displacement site solely for the purpose of renting to others is not eligible. Considerations in the State's determination of loss of existing patronage are the type of business conducted by the displaced business and the nature of the clientele. The relative importance of the present and proposed locations to the displaced business and the availability of suitable replacement sites are also factors.

In order to determine the amount of the "in lieu of" moving expenses payment, the average annual net earnings of the business is to be one-half of the net earnings, before taxes during the two taxable years immediately preceding the taxable year in which the business is relocated. If the two taxable years are not representative, the State may use another two-year

period that would be more representative. Average annual net earnings include any compensation paid by the business to the owner, owner's spouse, or dependents during the period. Should a business be in operation less than two years, the owner of the business may still be eligible to receive the "in lieu of" payment. In all cases, the owner of the business must provide information to support its net earnings, such as income tax returns or certified financial statements, for the tax years in question.

Displaced farms and non-profit organizations are also eligible for actual reasonable moving costs up to 50 miles, actual direct losses of tangible personal property, search costs up to \$1,000 and reestablishment expenses up to \$10,000 or a fixed payment "in lieu of" actual moving expenses of \$1,000 to \$20,000. The State may determine that a displaced farm may be paid a minimum of \$1,000 to a maximum of \$20,000, based upon the net income of the farm, provided that the farm has been relocated or the partial acquisition caused a substantial change in the nature of the farm. In some cases, payments "in lieu of" actual moving costs may be made to farm operations that are affected by a partial acquisition. A non-profit organization is eligible to receive a fixed payment or an "in lieu of" actual moving cost payment, in the amount of \$1,000 to \$20,000 based on gross annual revenues less administrative expenses.

A more detailed explanation of the benefits and payments available to displaced persons, businesses, farms and non-profit organizations is available in the "Relocation Assistance" brochure that will be distributed at the public hearing for this project and be given to displaced persons.

Federal and state laws require that the State Highway Administration shall not proceed with any phase of a project which will cause the relocation of any persons, or proceed with any construction project, until it has furnished satisfactory assurances that the above payments will be provided, and that all displaced persons will be satisfactorily relocated to comparable decent, safe and sanitary housing within their financial means, or that such housing is in place and has been made available to the displaced person.

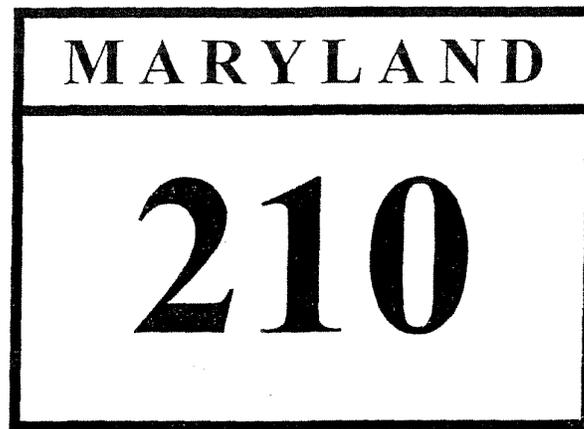
#### **PUBLIC LAW 105-117**

**On November 21, 1997, President William J. Clinton signed Public Law 105-117, amending the Uniform Relocation Assistance and Real Property Acquisition Policies Act, also known as the Uniform Act. The law became effective on the same day that it was assigned.**

**Public Law 105-117 provides that a person who is an alien and is not lawfully present in the United States shall not be eligible for relocation payments or other assistance under the Uniform Act. It also directed all State displacing agencies that utilize Federal funds in their projects to implement procedures for compliance with the 1997 amendments, in order to safeguard that funding.**

**To this end, displaced persons will be asked to certify to their Citizenship or alien status prior to receiving payment or other benefits under the relocation assistance program.**

DRAFT



**MARYLAND 210 CORRIDOR STUDY  
REGIONAL TRAVEL DEMAND ANALYSIS  
(Alternatives 1-B2 and 4B)**

January 21, 2000

**METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS**





## INTRODUCTION

As a part of the MD 210 project planning study sponsored by the Maryland State Highway Administration (SHA), COG/TPB staff was asked to apply the regional travel demand forecasting model to evaluate the transportation demand of various transportation alternatives along the study corridor. COG staff completed the travel demand for the first set of alternatives and summarized the results in a March 24, 1999 report. The report, which was presented at the March 24, 1999 Alternative Recommendations meeting, briefly described each alternative and summarized travel time and corridor level mode choice results.

In December, 1999 and January, 2000 COG staff analyzed travel demand for a second set of alternatives. This report summarizes these results, and compares them to the results presented in the March 24, 1999 report.

## ASSUMPTIONS

All of the alternatives tested assumed 2020 land use conditions (round 6a) and the transportation assumptions were developed around the FY 99-04 Constrained Long-Range Plan (CLRP). The definition of HOV in the HOV alternatives refers to HOV-3. The HOV alternatives assume 24-hour HOV lanes on the Capital Beltway from MD 210 across the Woodrow Wilson Bridge to U.S. 1 in Virginia. The HOV lanes in alternative 4B would have direct access to the Beltway HOV lanes, creating an HOV system.

- A. **Baseline (No-Build) (run previously):** The baseline scenario is based on the highway and transit assumptions in the CLRP.

This scenario, as well as all the alternatives, assumes 10 lanes and a \$1.00 toll on the Woodrow Wilson Bridge. MD 210 is assumed to have 3 travel lanes in each direction.

- B. **Alternative 1-B (run previously):** This alternative assumes the same highway assumptions as in the baseline scenario, but uses an enhanced transit network.

This enhanced transit network was based on transit assumptions from the Woodrow Wilson Bridge study and were further modified to accommodate the MD 210 corridor. These modifications were based on submissions from WMATA and Prince Georges' County. The enhanced transit network includes routes and assumptions from the Prince George's County Transit Development Master Plan (TDMP) and assumes that the headways for all peak bus service would not exceed 15 minutes. The transit network includes a combination of local bus service and express bus service to and from the Park and Ride Lots along MD 210 and Anacostia Metrorail station.



- C. **Alternative 1-B2:** This alternative pivots off of alternative 1-B. It assumes the same highway assumptions as in the baseline scenario, but increases transit service from Alternative 1-B.

Using the transit service coded in Alternative 1-B as a base, alternative 1-B2 included additional park-and-ride lots, additional and modified bus routes, and increased frequency of bus service. Additional park-and-ride lots are in the MD 210 corridor. Additional and modified bus routes include service between the MD 210 corridor and Arlington (Crystal City / Pentagon area), Alexandria (Old Town / Eisenhower Ave. area), Tysons Corner, Bolling AFB, Andrews AFB, the Anacostia Metro station, and downtown DC. August, 1999 letters (attached) from WMATA and MTA outline the assumptions coded in this alternative.

- D. **Alternative 4(run previously):** Two-lane, reversible flow, barrier-separated HOV facility from Capital Beltway to MD 228.

There are 3 access and 3 egress ramps assumed in this alternative located at the vicinity of Fort Washington Road, Livingston/Palmer Road, and north of MD 373. It was assumed that the HOV lanes would only operate during the morning and evening rush and would not provide any additional off-peak general use capacity.

- E. **Alternative 4B:** This alternative pivots off of alternative 4. The transit assumptions are the same as in 1-B2, above. The HOV assumptions are similar to those of alternative 4, with some access modifications.

There is a two-lane reversible, barrier-separated HOV facility in the median of MD 210 from MD 228 to the Capital Beltway. There are three general use lanes in each direction. Direct connections from the HOV lanes to/from the S-curve/I-295 and the Capital Beltway to the west are included. Interchanges, instead of intersections, are assumed at all major road crossings on MD 210 from Old Fort Road South to the Capital Beltway. HOV on MD 210 is assumed to operate during the morning and evening rush in the peak direction and would not provide any additional off-peak general use capacity.

## PRELIMINARY FINDINGS

The follow summaries include data from the previous alternatives for comparison purposes.



A. Travel Time Summaries

The following table represents travel times from the specific origin zone and destination zone pairs within the following markets,

		DESTINATIONS															
		Oxon Hill					Downtown D.C					Arlington					
		Base	Alt 1B	Alt 1B2	Alt 4	Alt 4B	Base	Alt 1B	Alt 1B2	Alt 4	Alt 4B	Base	Alt 1B	Alt 1B2	Alt 4	Alt 4B	
ORIGINS	Md 228	LOV	38	38	36	39	39	79	79	76	80	80	77	77	76	79	79
		HOV	N/A	N/A	36	20	18	N/A	N/A	76	52	52	N/A	N/A	76	46	46
		Transit	53	53	25	28	25	77	77	65	77	65	76	76	62	76	62
	Swan Creek	LOV	18	18	19	18	18	59	59	59	59	59	57	57	58	59	59
		HOV	N/A	N/A	19	12	10	N/A	N/A	59	44	44	N/A	N/A	58	38	38
		Transit	32	32	26	21	26	69	69	69	69	69	68	68	54	61	54

B. Corridor-Level Mode-Choice Results

The following data were derived from the COG mode-choice model. The model output was sorted to include only information for the study corridor. This process enables the analysis of the data which are more pertinent to MD 210. The 13,000 HOV persons in the baseline scenario are from trip origins in Arlington/Alexandria and destinations in Washington, D.C. and are generated from the I-66 and I-395 HOV lanes. The majority of the 370,700 transit trips are those trips occurring within the District of Columbia and from Arlington and Alexandria to D.C.

Corridor Level Mode Choice Results - Total Average Daily Person Trips

	LOV		HOV		TRANSIT	
Baseline	569,800		13,000		370,700	
	Difference	% Change	Difference	% Change	Difference	% Change
Alt 1-B	-1,900	-0.3%	300	2.3%	2,200	0.6%
Alt 1-B2	-3,300	-0.6%	-300	-2.3%	3,600	0.9%
ALT 4	-30,000	-5.3%	30,600	235.4%	-100	0.0%
ALT 4B	-33,100	-5.8%	33,400	256.9%	-110	0.0%

*HOV robs ridership from transit*

In summary, the preliminary results show that alternative 4B (barrier-separated HOV with enhanced transit from alternative 1-B2) has the greatest impact on the study corridor with HOV impacts 10 times those of transit.



MASS TRANSIT ADMINISTRATION

MARYLAND DEPARTMENT OF TRANSPORTATION

*Parris N. Glendening, Governor • John D. Porcari, Secretary • Ronald L. Freeland, Administrator*

August 24, 1999

12/14  
will send  
Maps

Mike Clifford  
Department of Transportation Planning  
Metropolitan Washington Council of Governments  
777 North Capital Street, N.W.  
Washington DC 20002-4239

Dear Mr. Clifford:

Enclosed is a list of Maryland's Mass Transit Administration proposed transit routes for the MD210 Multi Modal Study modeling effort. If you have and questions, please feel free to contact me.

Sincerely,

MaryAnne Polkiewicz  
Regional Planner

cc: Nancy Noonan, Chief of Regional Planning, MTA  
Joel Eisenfeld, Regional Planner, MTA  
Heather Murphy, Project Manger, SHA

My phone number (410) 767-3426 FAX number (410) 333-0489 TTY (410) 539-3497

William Donald Schaefer Tower • 6 Saint Paul Street • Baltimore, Maryland 21202-1614

Toll Free # 1-888-218-2267



Southern Maryland Transit Service Proposal

**910 Indian Head Service:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	10 mins.	15	5:00-7:20	Indian Head Bryons Road Accokeek* Washington	\$3.35 \$2.85 \$2.00
PM	10 mins.	15	3:20-5:40	Washington Accokeek* Bryons Road Indian Head	\$2.00 \$2.85 \$3.35

**901 La Plata Service:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	3 mins	58	5:00-7:51	La Plata (29) US301 Waldorf Washington	\$3.35 \$3.35
PM	3 mins	58	3:00-5:51	Washington US301 Waldorf La Plata (29)	\$3.35 \$3.35

**905 St. Mary's County Service:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	5 mins.	42	4:30-7:25	California(21 Trips) Charlotte Hall MD5 Waldorf Washington	\$4.35 \$3.85 \$3.35
PM	5 mins	42	2:50-6:15	Washington MD5 Waldorf Charlotte Hall California (21 Trips)	\$3.35 \$3.85 \$4.35

\*Accokeek Park and Ride fare based on WMATA fares.

Southern Maryland Transit Service Proposal

“Kitchen Sink” Items

**Indian Head Reverse Commute:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	15 mins.	6	6:00-7:15	Anacostia Metro Oxon Hill P&R Indian Head NSW	\$3.35 \$3.35
PM	15mins	6	3:30-4:45	Indian Head NSW Oxon Hill P&R Anacostia Metro	\$3.35 \$3.35

**Paxtuxent River NAS Reverse Commute:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	20 mins.	6	5:00-6:40	Anacostia Metro Oxon Hill P&R MD5 P&R Patuxent NAS	\$4.35 \$3.85 \$3.35
PM	20 mins.	6	3:30-5:10	Patuxent NAS MD5 P&R Oxon Hill P&R Anacostia Metro	\$3.35 \$3.85 \$4.35

**Indian Head to Tysons Corner:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	20 mins.	6	5:00-6:40	Indian Head Bryons Road Accokeek* Tysons Corner	\$4.85 \$4.35 \$2.00
PM	20 mins.	6	4:00-5:40	Tysons Corner Accokeek* Bryons Road Indian Head	\$2.00 \$4.35 \$4.85

\*Accokeek Park and Ride fare is based on WMATA fare.

**Indian Head to Crystal City:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	20 mins.	6	5:00-6:40	Indian Head	\$4.35
				Bryons Road	\$3.85
				Accokeek*	\$2.00
				Crystal City	
PM	20 mins.	6	4:00-5:40	Crystal City	
				Accokeek*	\$2.00
				Bryons Road	\$3.85
				Indian Head	\$4.35

**Waldorf to Bolling AFB:**

	<u>Headways</u>	<u>Trips</u>	<u>Hours</u>	<u>Stops</u>	<u>Fares</u>
AM	20 mins.	6	5:30-7:10	US301 P&R	\$3.35
				Accokeek*	\$2.00
				Bolling AFB	
PM	20 mins.	6	3:30-5:10	Bolling AFB	
				Accokeek	\$2.00
				US301 P&R	\$3.35

\*Accokeek Park and Ride fare is based on WMATA fare.



Mike -  
I need you to now the  
contact for the 40 210 project.  
Larry had discussed this  
previously, so please feel free  
to call if you need me to fill  
in any blanks.  
- Kathleen

August 23, 1999

~~Larry~~  
Mr. ~~Larry~~ Mike Clifford  
Department of Transportation Planning  
Metropolitan Washington Council of Governments  
777 North Capitol Street, N.W.  
Washington, DC 20002-4239

Dear ~~Larry~~ Mike

I am enclosing descriptions of both local and express bus routes to be coded and modeled for the Maryland Route 210 Major Investment Study. While the descriptions should be fairly self-explanatory, please feel free to call me at (202) 962-1034 if you have any questions.

Sincerely,

Kathleen Donodeo  
Associate Director

cc: Heather Murphy, MD SHA

**Washington  
Metropolitan Area  
Transit Authority**

600 Fifth Street, NW  
Washington, D.C. 20001  
202/962-1234

By Metrorail:  
Judiciary Square-Red Line  
Gallery Place-Chinatown  
Red, Green and  
Yellow Lines

A District of Columbia,  
Maryland and Virginia  
Transit Partnership

**Suggested WMATA - Compact Area Routes for Modelling  
Maryland Route 210 MIS**

Local Routes

- All routes on 10-minute headways, all fares \$1.10
- Add shuttle from Oxon Hill Park & Ride to National Harbor.
- Code all existing routes as they currently operate; have them merge into the HOV lanes as soon as they are permanently on Route 210.
- Add one route serving Route 210 from Accokeek Park & Ride to Oxon Hill Park & Ride and then continuing on to Anacostia Metrorail Station. This route would not use the HOV lanes.

Express Routes

- All routes on 10-minute headways
- 18 routes: three origin pairs, each servicing six different destinations

<u>Origin Stops</u>	<u>Destination Stops</u>	<u>Fares</u>
ABC Park & Ride	Tysons Corner	\$2.00
Oxon Hill Park & Ride	Old Town Alexandria	\$2.00
	Crystal City	
	Pentagon	
	Eisenhower Valley	\$2.00
	Bolling Air Force Base	\$1.10
	Andrews Air Force Base	
Brandywine Park & Ride (Via Route 223)	Anacostia Metrorail	\$1.10
	Ft. Belvoir	\$2.00
	Tysons Corner	\$2.00
Ft. Washington Park & Ride	Old Town Alexandria	(\$2.00 (For all Routes))
	Crystal City	
	Pentagon	
	Eisenhower Valley	